DUBROV, A. P., TAGEYEVA, S. V. Inst. of Biophysics, Academy of Sciences, Moscow.

"Photoreactivation in Plant Cells."

paper submitted for the Third Intl. Congress on Photobiology, Copenhagen, 31 July - 5 August 1960.

DUBROV, A.P.

Action of ultraviolet radiation on pH and rH_2 of plant cells. TSitologiia 2 no.2:161-169 Mr-Ap '60. (MIRA 14:5)

1. Laboratoriya fotobiologii Instituta biologicheskoy fiziki AN SSSR Moskva.

(ULTRAVIOLET RAYS--PHYSIOLOGICAL EFFECT)
(PLANTS, EFFECT OF RADIATION ON)

DUBROV, A.P.

Photoreactivation of plant cells. Biofizika 5 no. 4:438-443 '60.
(MIRA 13:12)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.
(PLANTS, EFFECT OF LIGHT ON)

DUBOV, A.P.

Over-all use of a phase contrast device. Lab. delo 7 no.5:58-59 My '61. (MIRA 14:5)

1. Kabinet novykh metodov mikroskopii Instituta biofiziki AN SSSR, Moskva.

(PHASE MICROSCOPE)

DUBROV, A.P.

Easy method for ultraviolet microradiation of organella in live cells. TSitologiia 4 no.1:88-90 Ja-F '62. (MIRA 15:4)

1. Kabinet novykh metodov mikroskopii Instituta biofiziki AN SSSR, Moskva.
(ULTRAVIOLET RAYS) (MICRORADIOGRAPHY) (MICRURGY)

DUBROV, A.P.

Recent development of the method of ultraviolet microirradiation in biology. Biofizika 7 no.5:634-639 '62. (MIRA 17:8)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

ACCESSION NR AM4016119 BOOK EXPLOITATION S/

Dubrov, Aleksandr Petrovich

The effect of ultraviolet radiation on plants (Deystviye ul'trafioletovoy radiatsii na rasteniya), Moscow, Izd-vo AN SSSR, 1963, 123 p. illus.,biblio. Errata printed on the inside of back cover. 2,500 copies printed. Sponsoring agency: Akademiya nauk SSSR. Institut biologicheskoy fiziki.

TOPIC TAGS: ultraviolet radiation effect, vegetation, photoreactivation

TABLE OF CONTENTS:

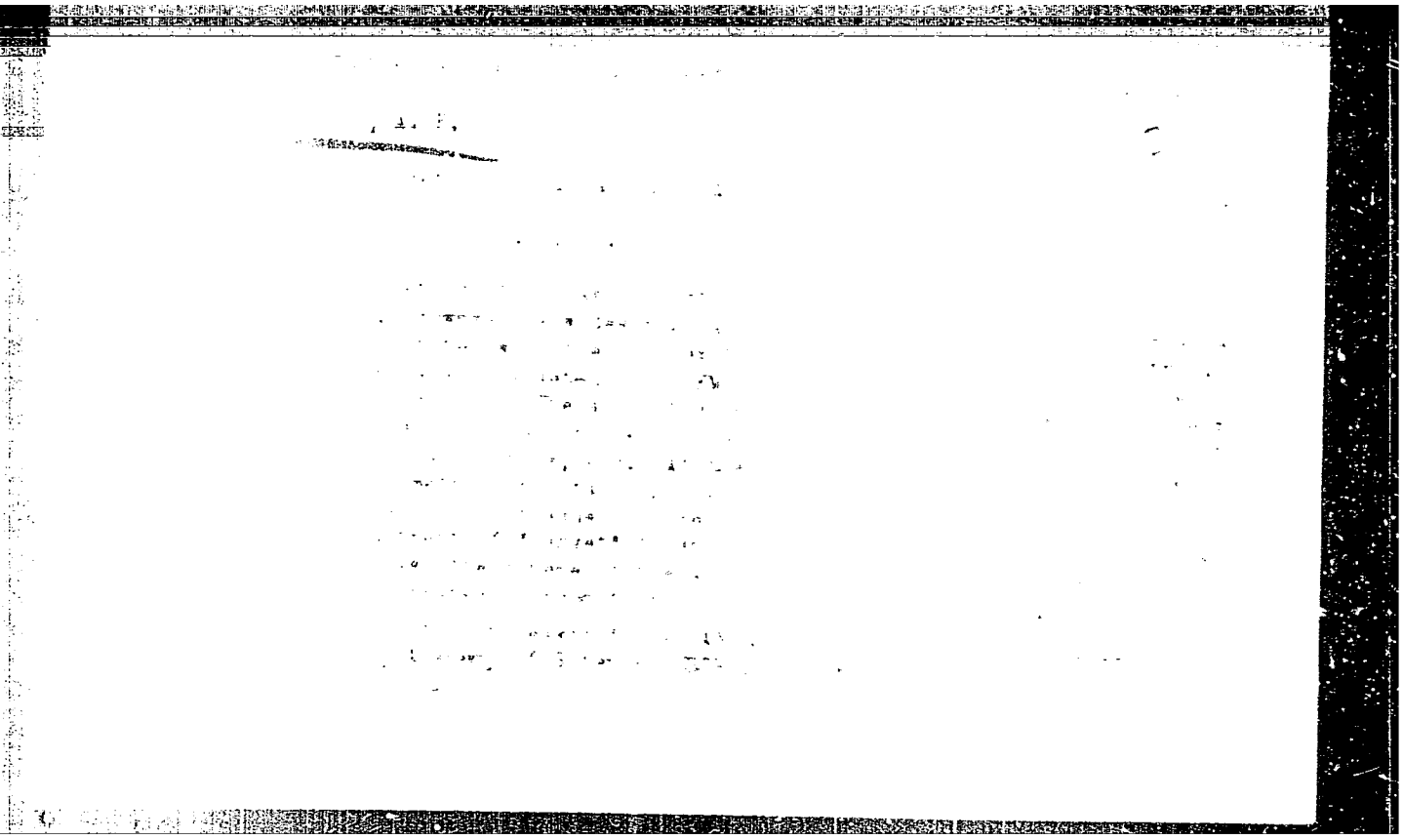
Card 1/2

ACCESSION NR AM4016119

SUB CODE: AM SUBMITTED: 16Jul63 NR REF SOV: 089

OTHER: 357 DATE ACQ: 10Dec63

Card 2/2



APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R000411410011-8"

GOL'DIN, M.I.; DUBROV, A.P.

Ultraviolet microirradiation of the crystals of tobacco mosaic virus in a live cell. Dokl. AN SSSR 157 no.5:1219-1220 Ag '64. (MIRA 17:9)

1. Predstavleno akademikom A.A. Imshenetskim.

DUBROV[illegible], Alekseĭ Timofeyevich; MAMOLIN, Ya.A., redaktor; MAL'CHEVSKIY, O.N., redaktor karty; KOSHELEVA, S.M., tekhnicheskiy redaktor.

[The Ukrainian Soviet Socialist Republic; a brief economic geographic survey] Ukrainskaia Sovetskaia Sotsialisticheskaia Respublika; kratkaia ekonomiko-geograficheskaia spravka. Moskva, Gos. izd-vo geogr. lit-ry, 1954. 54 p. [Microfilm] (MLRA 7:11)
(Ukraine--Economic geography)

ODINKOVA, V.A.; DUBROV, E.Ya. (Moskva)

Lipocalcinogranulomatosis of the subcutaneous cellular tissue. Arkh.pat. no.7:64-67 '62. (MIRA 15:9)

1. Iz patologoanatomicheskogo otdela (nauchnyy rukovoditel' - chlen-korrespondent AMN SSSR prof. A.P. Avtsyn) i 1-y khirurgicheskoy kliniki (zav. - prof. N.I. Makhov) Moskovskogo oblastnogo nauchno-issledovatel'skogo klinicheskogo instituta.
(SKIN—CALCIFICATION)

SELEZNEV, G.F.; DUBROV, E.Ya.

Surgical treatment of fistulas of the stomach, small intestine and colon. Sov. med. 27 no.10:36-41 O '63. (MIRA 17:6)

1. Iz I-y khirurgicheskoy kliniki (zav.-prof. N.I. Makhov) Moskovskogo oblastnogo nauchno-issledovatel'skogo klinicheskogo instituta imeni M.F. Vladimirskogo.

STEPANOVA, M.N.; RUTBERG, R.A.; DUBROV, E.Ya.

Hemophilia A in a young girl. Probl. gemat. i perel. krovi 9 no.8:30-32 Ag '64. (MIRA 18:3)

1. Detskoye khirurgicheskoye otdeleniye (zav. M.N. Stepanova) i laboratoriya fraktsionirovaniya belkov (zav. - prof. G.Ya. Rozenberg) TSentral'nogo ordena Lenina instituta gematologii i perelivaniya krovi, Moskva.

STEPANOVA, M.N., kand. med. nauk; DUBROV, E.Ya.

Clinical aspects and treatment of hemophilia in children. Sov. med. 27 no.3:104-109 Mr '64. (MIRA 17:11)

1. Detskoye khirurgicheskoye otdeleniye (zav. M.N. Stepanova) Moskovskogo oblastnogo nauchno-issledovatel'skogo klinicheskogo instituta imeni Vladimirskogo.

LAVRISHCHEVA, G.I.; DUBROV, E.Ya. (Moskva)

Primary healing of bone injuries. Arkh. pat. 27 no.3:37-43 '65. (MIRA 18:5)

1. TSentral'nyy institut travmatologii i ortopedii (dir. - chlen-korrespondent AMN SSSR prof. M.V. Volkov; zav. patologoanatomicheskim otdeleniyem - prof. T.P. Vinogradova) Ministerstva zdravookhraneniya SSSR, I khirurgicheskaya klinika (zav. - prof. N.I. Makhov) i patomorfologicheskoye otdeleniye (nauchnyy rukovoditel' - chlen-korrespondent AMN SSSR prof. A.P. Avtsyn) Moskovskogo oblastnogo nauchno-issledovatel'skogo klinicheskogo instituta imeni Vladimirskogo.

DUBROV, G.B.

AUTHOR: Alferov, V. V. 30-58-4-24/44

TITLE: The Use of Antibiotics in Food Industry (Primeneniye antibiotikov v pishchevoy promyshlennosti). Conference at the Institute for Microbiology (Soveshchaniye v Institute mikrobiologii)

PERIODICAL: Vestnik Akademii Nauk SSSR, 1958, Nr 4, pp. 107-109 (USSR)

ABSTRACT: In the Institute for Microbiology of the AS USSR a conference took place on January 15 in which representatives of some other institutes of the AS USSR, of the VASKhNIL, the scientific research institutes as well as of a number of industrial enterprises took part. The conference was devoted to the problem of using antibiotics for the preservation of food. A. A. Imshenetskiy, Director of the Institute foe Microbiology, underlined in his opening speech the tasks facing microbiology. Further reports were given by:
1) G. B. Dubrov, representative of the Scientific Research Institute for the Mechanization of Fish Industry, on the

Card 1/3

results obtained by the institute in the use of antibiotics for storing fresh fish.

2) V. K. Diklop (All-Union Scientific Research Institute for Meat Industry) on the use of antibiotics for preserving meat.

3) T. B. Ovcharova (All-Union Scientific Research Institute for Canning and Vegetable Drying Industry) on the possibilities of using some antibiotics of vegetable as well as of bacterial origin).

4) A. Ya. Onikiyenko (Leningrad, Scientific Research Institute for Mechanizing Fish Industry) on the use of spectroscopic methods for quick determination of the residual quantities of antibiotics in food.

The Use of Antibiotics in Food Industry. 30-58-4-24/44
Conference at the Institute for Microbiology

5) V. P. Sorokin (Prikarpatskiy Military District Veterinary Laboratory) on experiences collected with biomycine (biomitsin) in storing meat.

6) Yu. I. Rubinshteyn (Nutritional Institute of the Academy of Medical Sciences of the USSR) on problems of hygiene.

The lecturers pointed out the necessity of increasing research work and underlined the importance of the determination of new antibiotics. In the final decision further research in this field was outlined.

1. Antibiotics—Applications 2. Food—Processing

Card 3/3

DUBROV, G.L., inzh.; MAMAY, A.V., inzh.

Electrodes for machining metals by electric erosion techniques.
Mashinostroenie no.2:43-44 Mr-Ap '65. (MIRA 18:6)

KAPITANAKI, M.V., kand. veter. nauk; SKOROBOGATCHENKO, I.V., veter. vrach; DUBROV, I.S., veter. vrach

Use of dry vaccines of fowl pasteurellosis from the AB and K strains. Veterinariia 41 no.10:32-33 O '64.

(MIRA 18:11)

1. Krasnodarskaya nauchno-issledovatel'skaya veterinarnaya stantsiya (for Kapitanaki). 2. Krasnodarskaya kraevaya veterinarnaya laboratoriya (for Skorobogatchenko, Dubrov).

DUBROV, M., insh.

Over-all automation of the power plant on the motorship "Spendiarov" and prospects for automating the basic types of vessels of the river fleet. Mech. transp. 19 no.4:22-25 Ap '60. (MIRA 14:3)
(Automatic control) (Marine diesel engines)
(Electricity on ships)

DUBROV, Mark Izrayelevich, zhurnalist; SHATALINA, M.A., red.; POL'SKAYA, R.G., tekhn.red.

[First shock workers' brigade] Pervaia udarnaia. Leningrad, Lenizdat, 1960. 96 p. (MIRA 15:5)

(Leningrad--Textile workers)

DUBROV, M., inzhener.

Steam tugs with Shmidt boilers. Mor.flot 7 no.1:14-16 Ja '47.
(MLRA 9:5)

(Turgboats) (Boilers, Marine)

M.

DUBROV, M., inzhener.

Three hundred hp. producer-gas-powered tugboat. Mor. flot 7 no.2:11-12 '47. (MLRA 9:6)
(Tugboats) (Gas and oil engines)

DUBROV, M.M.; ZHARKOV, F.Ya.; AKIMOV, P.P., red.; VOLCHOK, K.M., tekhn.red.

[Auxiliary mechanisms on river craft; an atlas] Vspomogatel'nye mekhanizmy rechnykh sudov; atlas. Leningrad, Izd-vo M-va morskogo i rechnogo flota SSSR, 1953. 203 p. (MIRA 13:8)
(Ships--Equipment and supplies)
(Inland water transportation)

DUBROV, M.M., insh.

Complete automatization of power plants on motorboats. Proizv.-tekh. sbor. no.1:5-12 '59. (MIRA 13:9)

1. TSentral'noy tekhniko-konstruktorskoye byuro.
(Marine engines) (Automatic control)

DUBROV, M.M., insh.

New diesel-electric multi-bucket dredger. Mech.transp. 16 no.11: 27-29 N '59. (MIRA 13:4)
(Dredging machinery) (Marine diesel engines)

DUEROV, M., insh.

Operational testing of turning gear with rudder. Rech.transp. 19 no.1:34-36 Ja '60. (MIRA 13:5)
(Steering gear--Testing)

DUBROV, Mikhail Mikhaylovich; REZNIKOV, E.G., red.; VOLCHOK, K.M., tekhn. red.

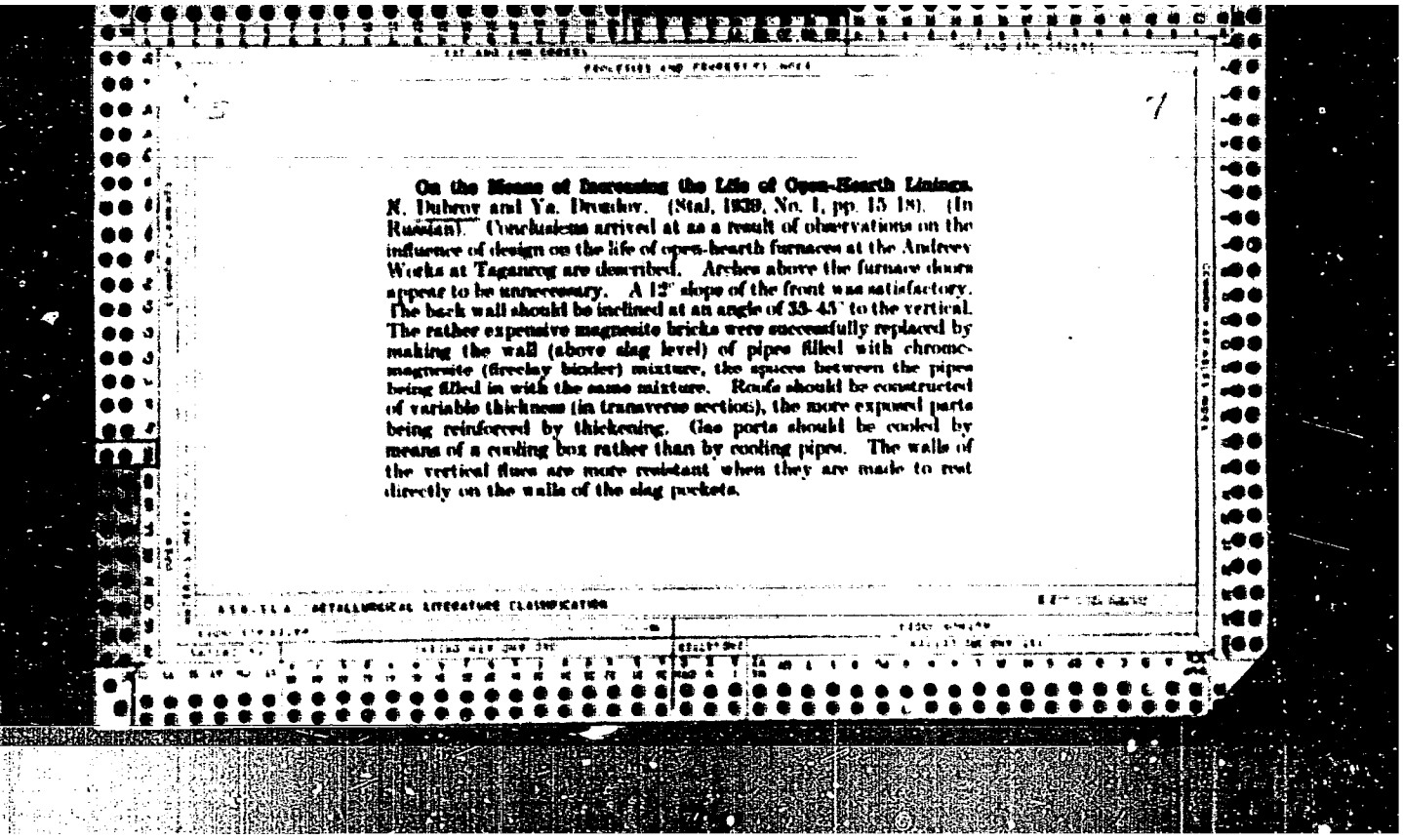
[Over-all automation of the power plant of the motorship "Spendiarov"] Kompleksnaia avtomatizatsiia silovoi ustanovki teplokhoda "Spendiarov." Leningrad, Izd-vo "Rechnoi transport," 1961. 59 p. (MIRA 14:11)
(Marine engines)

OSIFOV, L.L., inzh.; REZNIKOV, E.G., inzh., retsenzent; IVANOV, V.I., inzh., retsenzent; DUBROV, M.M., inzh., red.; SHLEMNIKOVA, Z.V., ved. red.

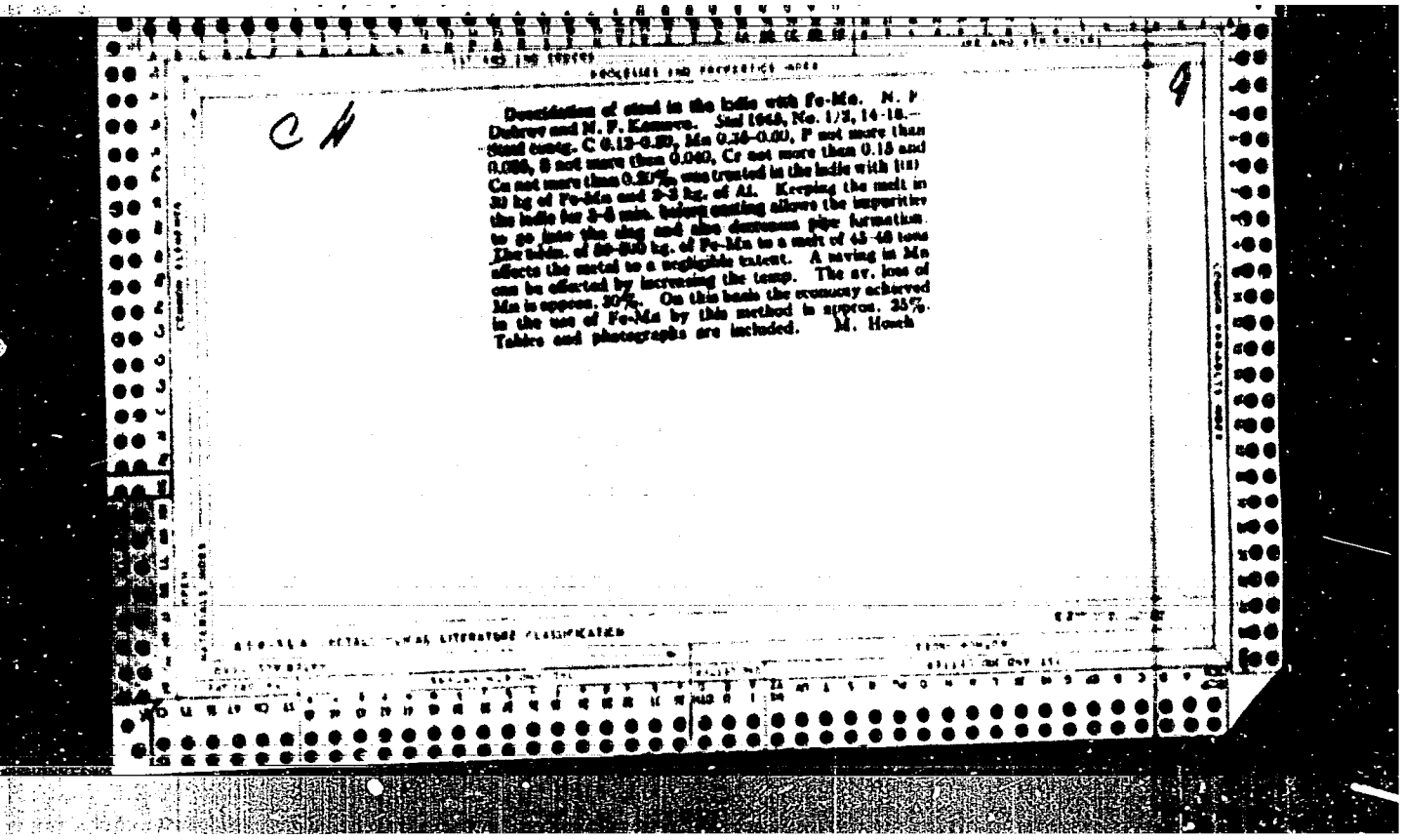
[Systems for the remote control of main marine mechanisms; diesel engines] Sistemy distantsionnogo upravleniia glavnymi sudovymi mekhanizmami; dizeliami. Moskva, Izd-vo "Transport," 1964. 159 p. (MIRA 17:6)

DUBROV, M.N., inzh.; IEVIN, M.I., kand. tekhn. nauk; TIKHOMIROV, B.V., inzh.

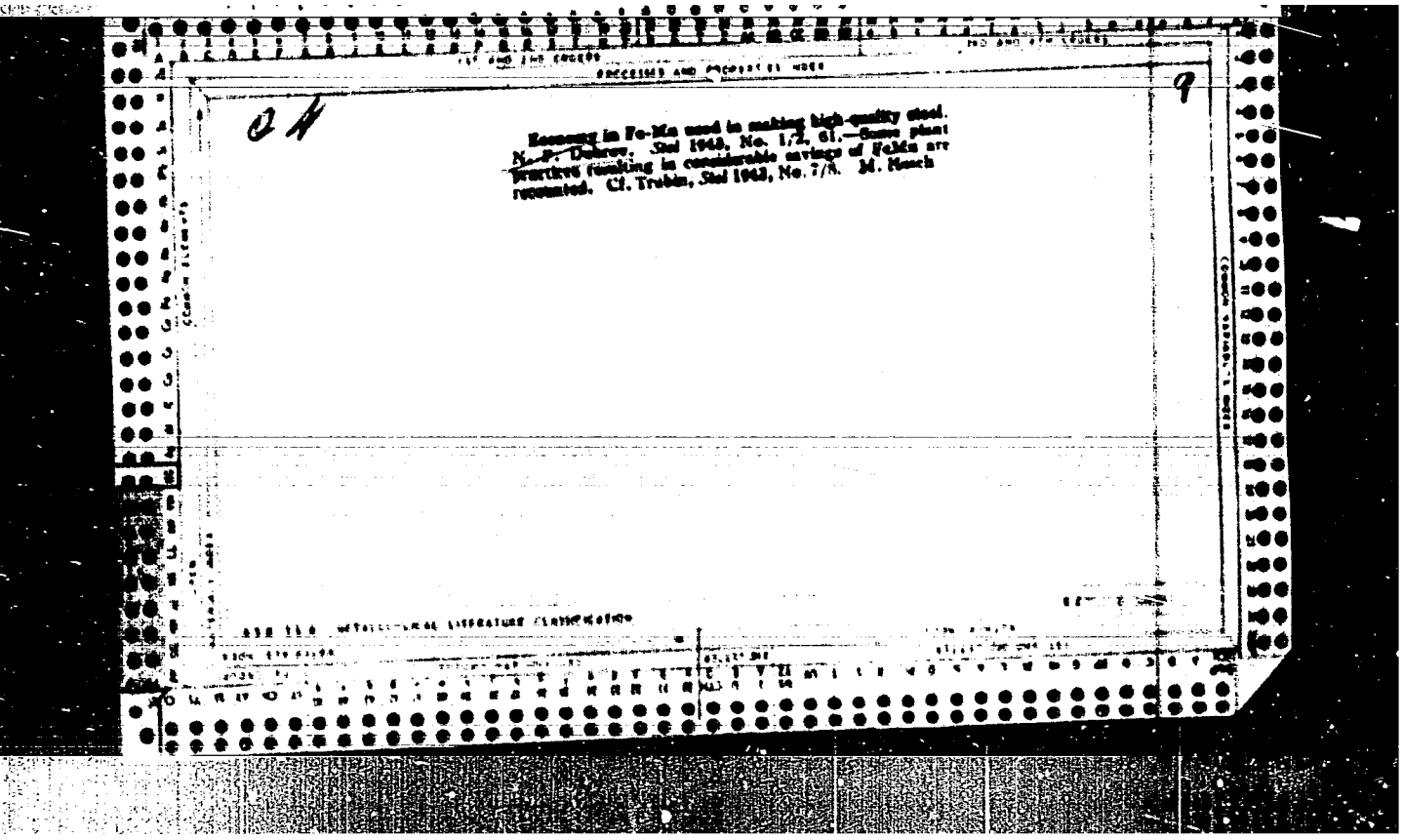
Automation of marine diesel power plants. Sudostroenie 30 no.9:
4-8 S '64. (MIRA 17:11)



On the Means of Increasing the Life of Open-Hearth Linings. N. Dubrov and Ya. Druzhov. (Stal, 1939, No. 1, pp. 15-18). (In Russian). Conclusions arrived at as a result of observations on the influence of design on the life of open-hearth furnaces at the Andreev Works at Taganrog are described. Arches above the furnace doors appear to be unnecessary. A 12° slope of the front was satisfactory. The back wall should be inclined at an angle of 35-45° to the vertical. The rather expensive magnesite bricks were successfully replaced by making the wall (above slag level) of pipes filled with chrome-magnesite (fireclay binder) mixture, the spaces between the pipes being filled in with the same mixture. Roofs should be constructed of variable thickness (in transverse section), the more exposed parts being reinforced by thickening. Gas ports should be cooled by means of a cooling box rather than by cooling pipes. The walls of the vertical flues are more resistant when they are made to rest directly on the walls of the slag pockets.



Deoxidation of steel in the ladle with Fe-Mn. N. P. Dubrov and N. P. Kamarov. Stal 1948, No. 1/2, 14-18.—Steel comp. C 0.12-0.20, Mn 0.30-0.60, P not more than 0.050, S not more than 0.040, Cr not more than 0.15 and Cu not more than 0.30%, was treated in the ladle with 10-30 kg of Fe-Mn and 2-3 kg. of Al. Keeping the melt in the ladle for 3-5 min. before casting allows the impurities to go into the slag and also decreases pipe formation. The addn. of 50-300 kg. of Fe-Mn to a melt of 45-60 tons affects the metal to a negligible extent. A saving in Mn can be effected by increasing the temp. The av. loss of Mn is approx. 30%. On this basis the economy achieved in the use of Fe-Mn by this method is approx. 25%. Tables and photographs are included. M. Hoseh



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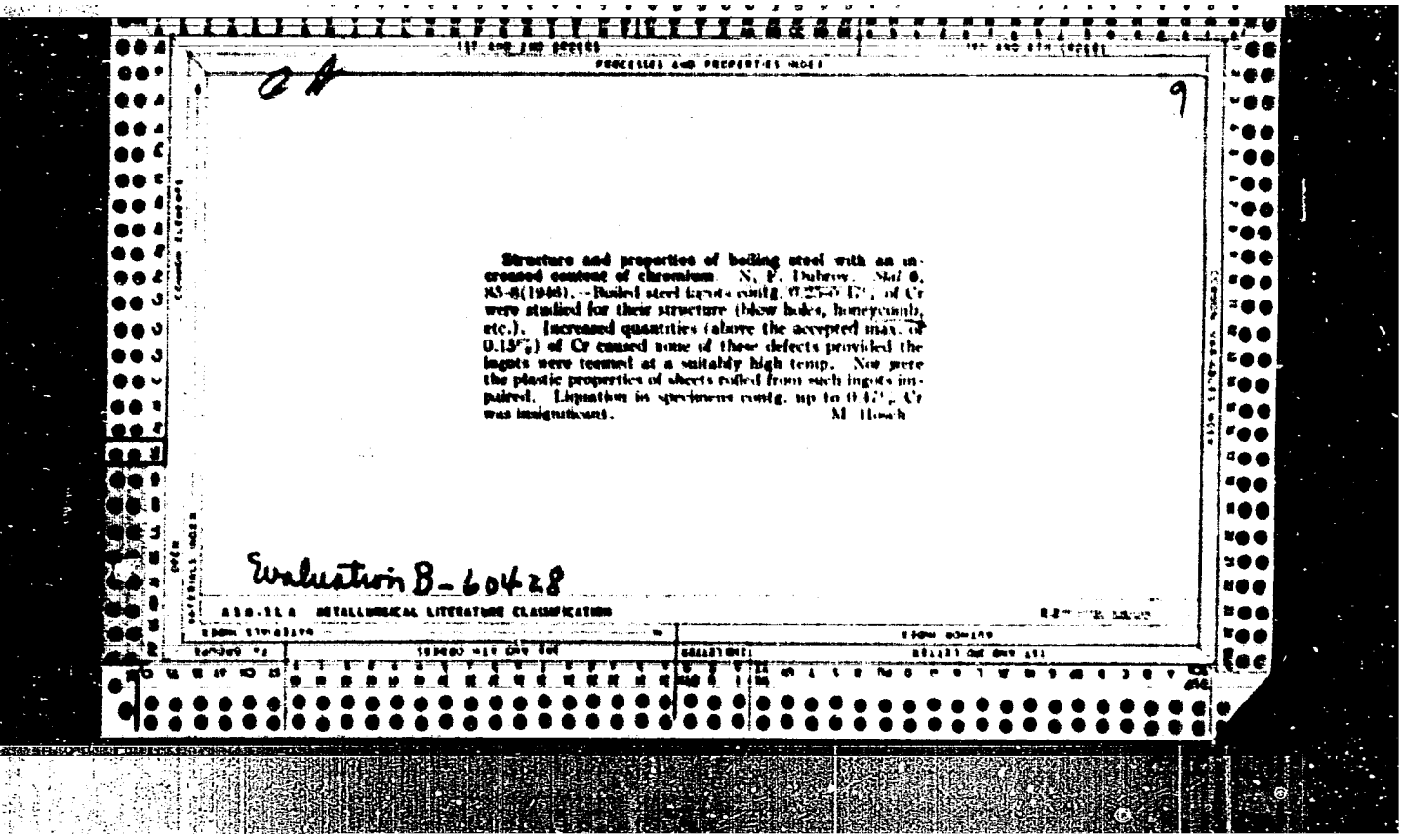
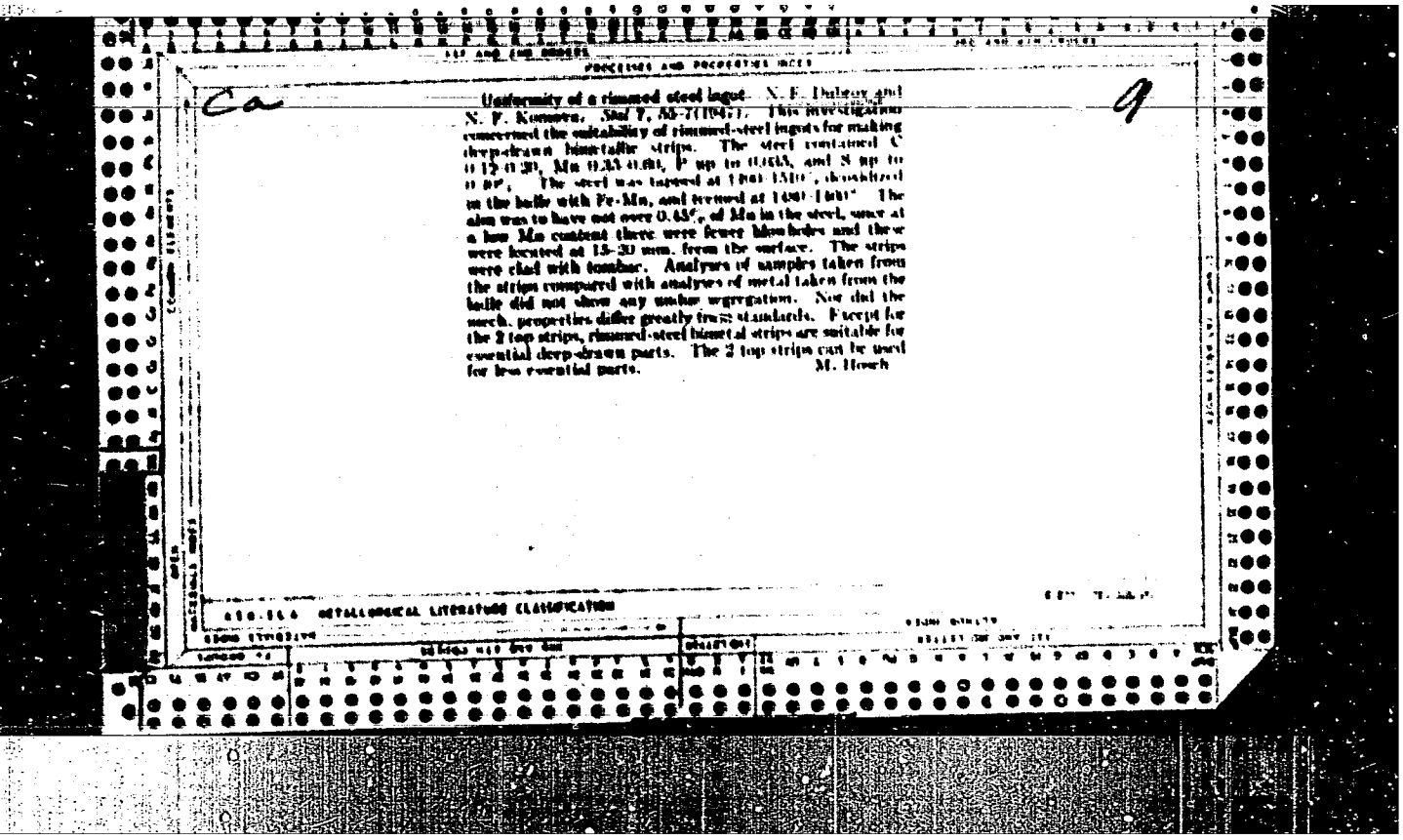
Economy in Fe-Mn used in making high-quality steel. N. P. Dubrov. Stal 1943, No. 1/2, 61.—Some plant practices resulting in considerable savings of Fe-Mn are recommended. Cf. Trubin, Stal 1943, No. 7/8. M. Hasch



Structure and properties of boiling steel with an increased content of chromium. N. P. Dubrov. *Stal'* 6, 85-8(1946).—Boiled steel ingots containg. 0.25-0.42% of Cr were studied for their structure (blow holes, honeycomb, etc.). Increased quantities (above the accepted max. of 0.13%) of Cr caused none of these defects provided the ingots were teemed at a suitably high temp. Nor were the plastic properties of sheets rolled from such ingots impaired. Liquation in specimens containg. up to 0.42% Cr was insignificant. M. Hosch

Evaluation B-60428



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Uniformity of a rimmed steel ingot. N. F. Dulsey and N. F. Kennora. *Stal'* 7, 53-7 (1947). This investigation concerned the suitability of rimmed-steel ingots for making deep-drawn bimetallic strips. The steel contained C 0.12-0.20, Mn 0.35-0.60, P up to 0.035, and S up to 0.05. The steel was teemed at 1500-1510°, deoxidized in the ladle with Fe-Mn, and teemed at 1490-1500°. The aim was to have not over 0.45% of Mn in the steel, since at a low Mn content there were fewer blowholes and these were located at 15-30 mm. from the surface. The strips were clad with tombac. Analyses of samples taken from the strips compared with analyses of metal taken from the ladle did not show any undue segregation. Nor did the mech. properties differ greatly from standards. Except for the 2 top strips, rimmed-steel bimetal strips are suitable for essential deep-drawn parts. The 2 top strips can be used for less essential parts. M. Hoseh

DUBROV, N. F.

PA 41T30

USSR/Engineering Jan 1948
Metallurgy
Rollers

"The Durability of Heat Treated Chilled Thin Plate Rollers," N. F. Dubrov, Candidate Tech Sci, Alapayevskiy Works, 1 p

"Stal'" No 1

States that the durability of chilled rollers depends not only on the chemical composition and structure of the rollers but also on the internal casting tensions. Various tests conducted at the Alapayevskiy Works to determine the durability of rollers. Lists results of tests on some ten rollers in table form.

41T30

PROCESSES AND PROPERTIES INDEX

Use of grog brick in checkers of open-hearth furnaces. N. F. Dubrov and M. D. Nikitenko. *Ogneupory*, 11, 560-63 (1946). The substitution of grog for Dinas brick raised the life of the checkers from an average of 170 to 210 heats. Greater improvement can be obtained by decreasing the porosity of the brick. The brick was made from Chasov Yar clay 25%, Vogul'sk clay 25%, and grog from Vogul'sk clay 50%. It analyzed SiO_2 57.8, $Al_2O_3 + TiO_2$ 38.98, Fe_2O_3 0.78, CaO 0.42, MgO 0.61, and ignition loss 0.14%; refractoriness was 1730°, porosity 22.7%, mechanical strength 207 kg./cm.², additional shrinkage at 1350° 1.1%, and initial softening under 2 kg./cm.² at 1380°. B. Z. K.

METALLURGICAL LITERATURE CLASSIFICATION

PA 160T30

DUBROV, N. F.

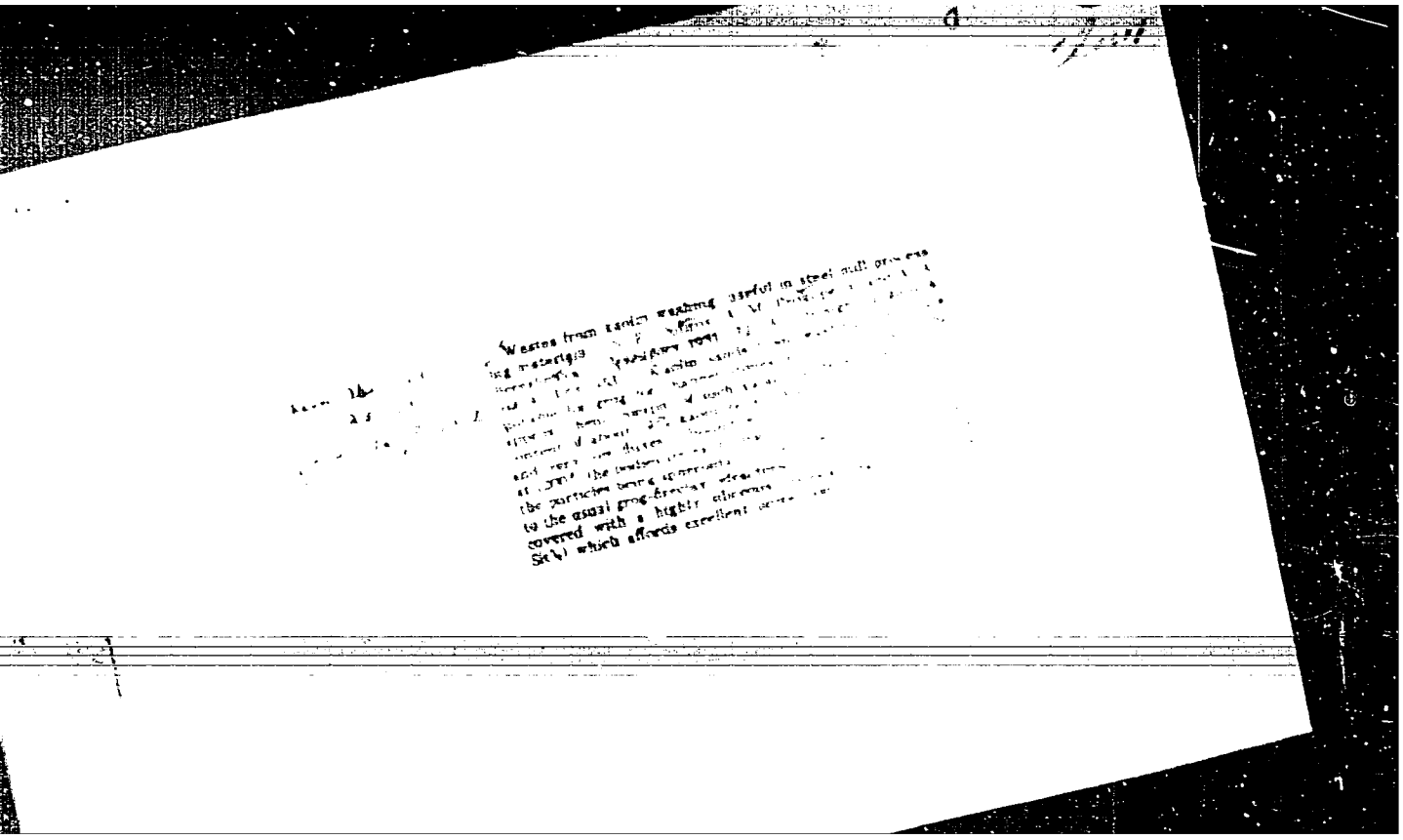
USSR/Engineering - Refractories Mar 50
Furnaces, Metallurgical

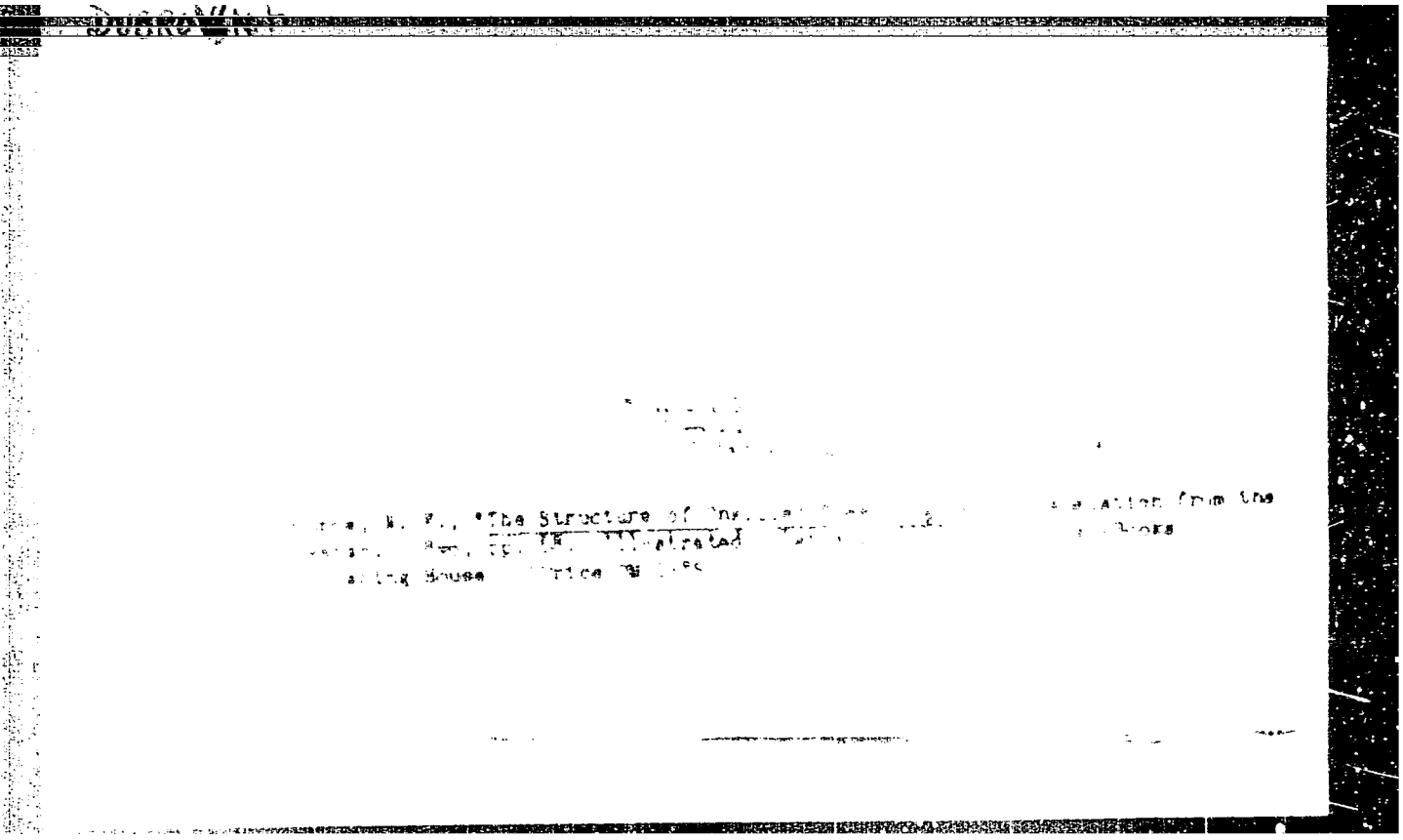
"Quality of Dinas Bricks in the Crown of a 70-Ton Open-Hearth Furnace," N. F. Dubrov, 4 pp

"Ogneupory" No 3, pp 108-12.

Reports improvement in service life of open-hearth furnace arch, from 150-180 to 200-250 melts in one metallurgical plant. Describes operational conditions of furnaces, type of firebrick, and results of investigation conducted in laboratories of All-Union Inst of Refractory Materials, Khar'kov.

160T30





[illegible], N. A.; [illegible]EVA, A. M., ENG.; BEREZHNAYA, A. A., ENG.

Kaolin

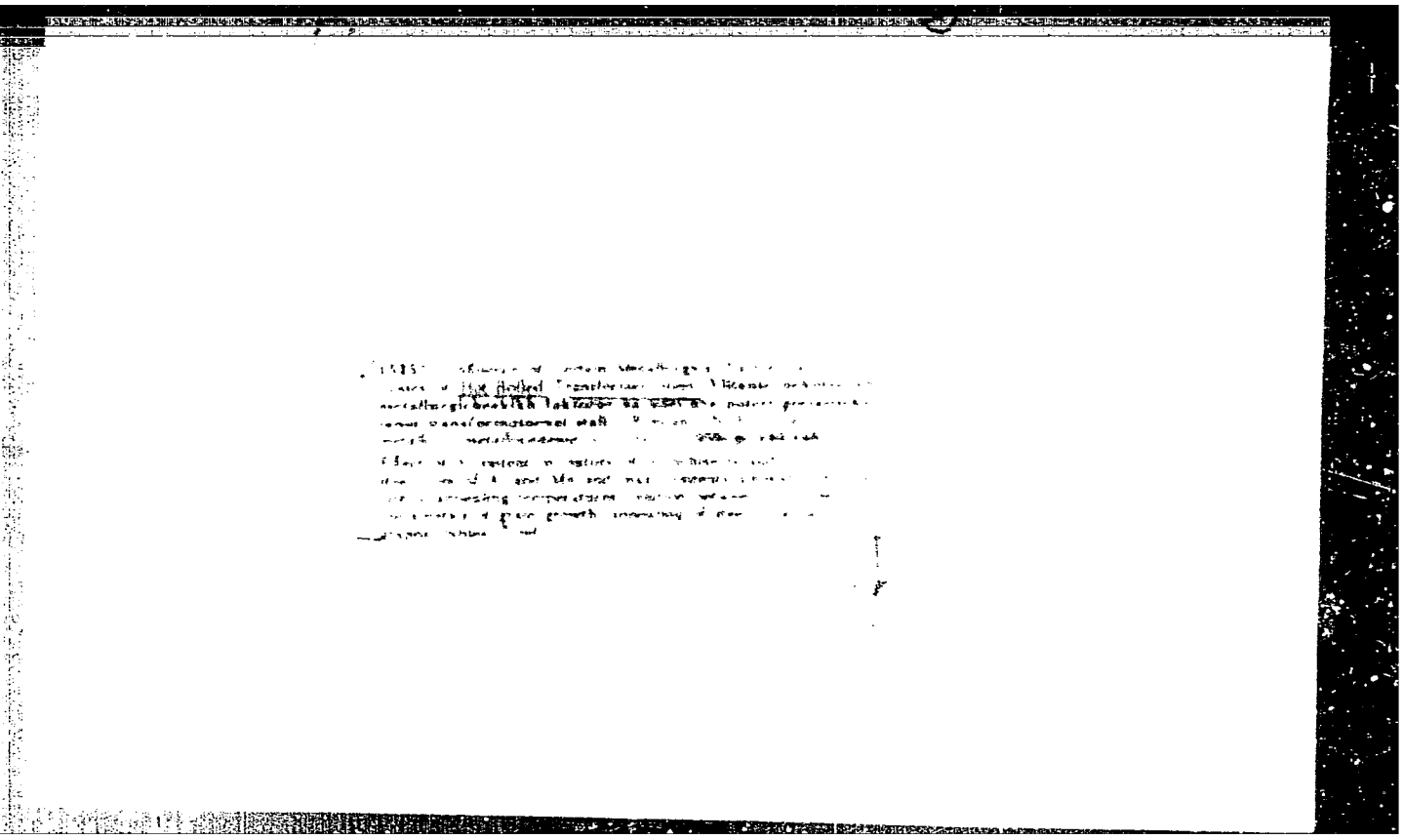
Tapping-hole materials made from kaolin waste, Ogneupory, 17, no. 7, 1952.

Monthly List of Russian Accessions, Library of Congress October 1952. UNCLASSIFIED

DUBROV, N.F., kand.tekhn.nauk; SHVARTSMAN, D.Sh.

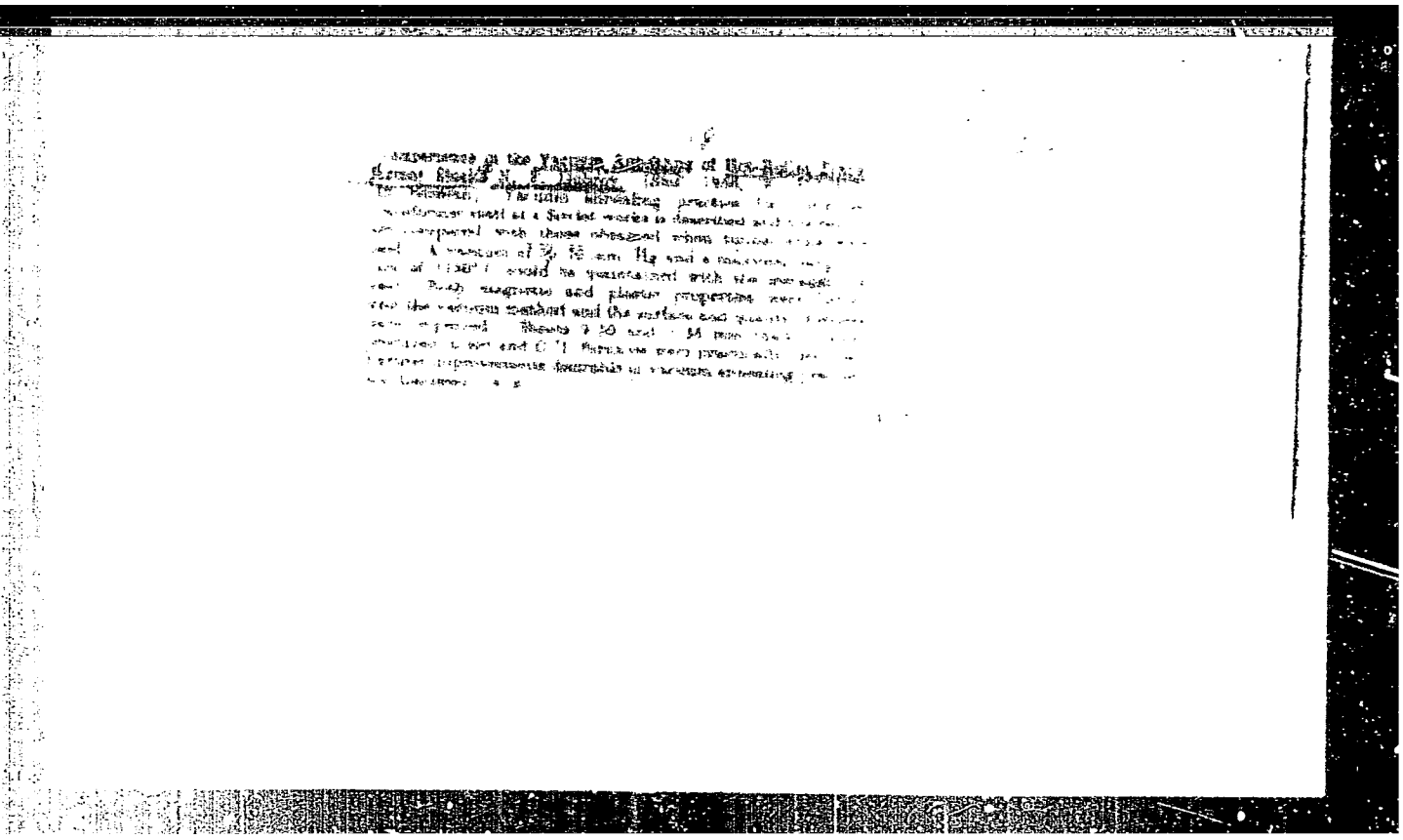
Life of heat-resistant chrome-magnesite bricks in open-hearth furnace crowns. Ogneupory 18 no.2:89-95 F '53. (MLRA 11:10)

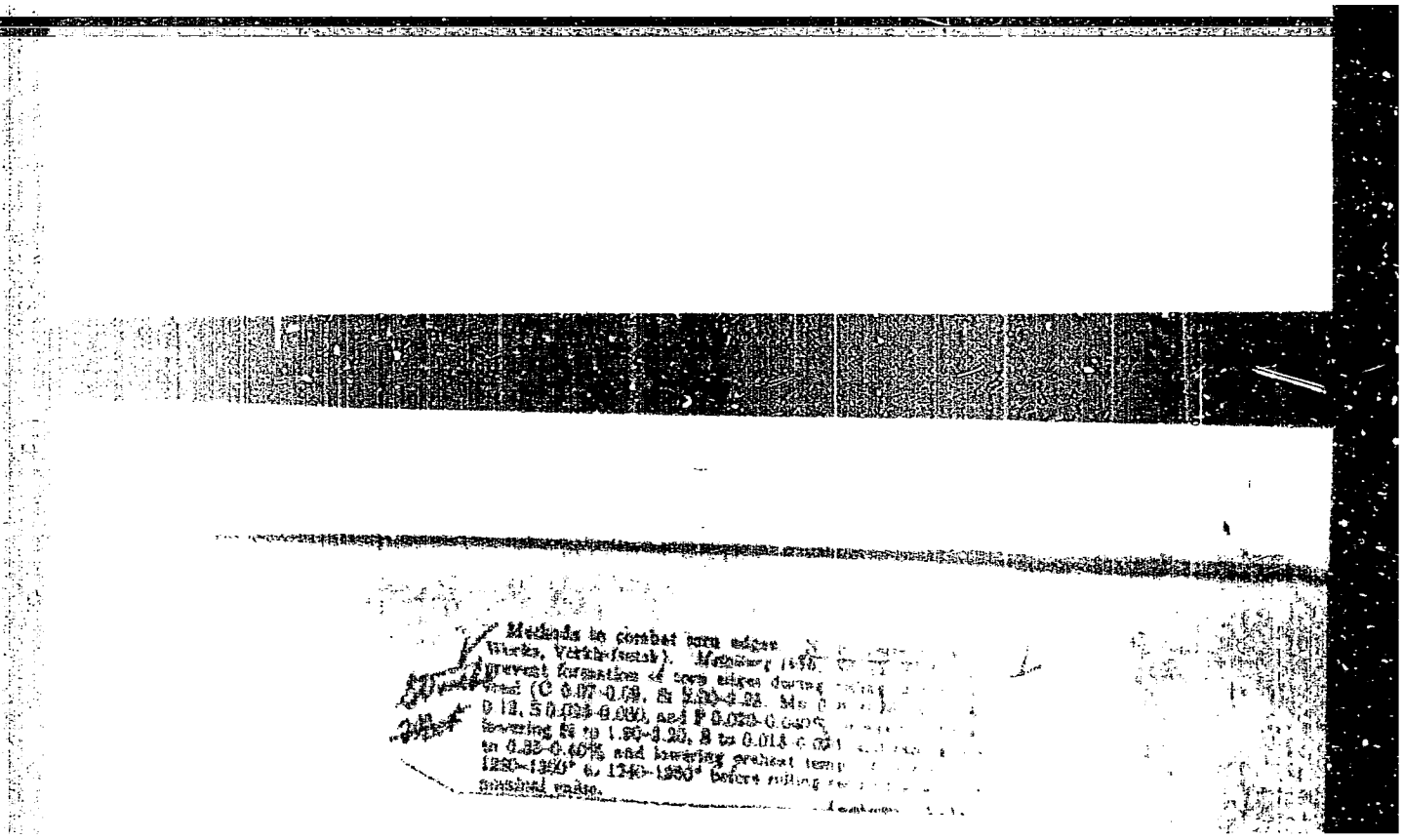
1.Verkhne-Isetskiy metallurgicheskiy zavod (for Dubrov) 2.Giseogneuper (for Shvartsman)
(Firebrick) (Open-hearth furnaces)



STRUGOVSHCHIKOV, Dmitriy Pavlovich; DUBROV, N.F., redaktor; KEL'NIK, V.P., redaktor izdatel'stva; KOVALENKO, N.I., tekhnicheskiy redaktor

[Steel casting; a technical manual] Razlivka stali; uchebnoe posobie dlia proizvodstvenno-tekhnicheskogo obucheniia rabochikh. Sverdlovsk, Obe. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe ot-nie, 1956. 192 p. (MLRA 9:11)
(Steel--Metallurgy)





DUBROV, M.F., kandidat tekhnicheskikh nauk; KOKIN, A.I., inzhener.

Desulfurization of transformer steel in the ladle. Stal' 16 no.1: 68-69 '56. (MLRA 9:5)

1. Verkh-Isetskiy metallurgicheskiy zavod.
(Steel--Metallurgy)

DUBROV, N.F.; SHVARTSMAN, I.Sh.

Using heat insulation for open-hearth furnace crowns made of chrome magnesite refractories. Ogneupory 21 no.7:289-299 '56.
(MLRA 10:1)

1. Verkh-Isetskiy metallurgicheskiy zavod(for Dubrov). 2.Giogneupor (for Shvartsman).
(Open-hearth furnaces) (Firebrick) (Insulation (Heat))

AUTHOR: Dubrov, N.F., Candidate of Technical Sciences and Koroleva, V.A., Engineer. 129-4-12/17

TITLE: Influence of the degree of vacuum during annealing on the properties of transformer steel. (Vliyaniye stepeni vakuuma pri otzhige na svoystva transformatornoy stali.)

PERIODICAL: "Metallovedenie i Obrabotka Metallov" (Metallurgy and Metal Treatment) 1957, No. 4, p. 51 (U.S.S.R.)

ABSTRACT: Experiments carried out on seven melts of hot rolled 0.5 mm thick transformer steel showed that an improvement of the vacuum in the electric furnace from 30 to 40 mm to 0.005 mm Hg col. brings about a considerable improvement of the properties of steel, for instance, the initial permeability of the annealed transformer steel increases from 400 to 870 Gauss/Oe and the magnetic induction in weak fields increases by 20 to 30%. With the degree of improvement of the vacuum during annealing the intensity of evaporation of carbon, sulphur and nitrogen increases, without affecting the grain size. The authors recommend annealing at a residual vacuum not worse than 0.5 mm Hg col. for transformer steel for which an initial permeability and induction in weak fields, $B_{0.05}$, is desired.

ASSOCIATION: Ural Scientific Research Institute for Ferrous Metals and Verkh-Isetskiy Metallurgy Works. (Uralskiy nauchno-issledovatelskiy Institut Chernykh Metallov i Verkh-isetskiy

Card 1/2

DUBROV, N.F.

133-7-26/28

AUTHOR: Dubrov, N.F., Candidate of Technical Sciences.

TITLE: Research Work of the Ural Iron and Steel Institute (Issledovatel'skiye raboty Uralskogo instituta chernykh metallov)

PERIODICAL: Stal', 1957, No.7, pp. 666 - 667 (USSR).

ABSTRACT: This is a short account of the research work carried out in 1956.

A. Production of pellets. The production of fluxed pellets (basicity 0.7 - 0.8) using a disc pelletiser from KMA ore was investigated together with the Uralmekhanobruda Institute. A good quality product can be obtained using limestone 0 - 0.5 mm size (up to 30%). The ignition of pellets on sinter strand is considered.

B. Production of fluxed sinter. It was established that the basic condition of producing a strong fluxed sinter is the completeness of the reaction of lime during sintering. Self-fluxing sinter (basicity 1.3) from fines of the Bakal'skiy deposits can be produced using 40% return fines. The production of sinter on the Bakal'skiy and Vysokogorskiy sinter plant of a basicity 0.4 and 1.0, respectively, was introduced with the technical assistance of the Institute.

Card 1/8C. Automatic proportioning of sinter mix components (together

Reseach work of the Ural Iron and Steel Institute.

with Uralmekhanobruda and Uralmetallurgavtomatika). A light and simple weighing apparatus suitable for automatic proportioning of sinter-mix components was developed. It is based on an induction transmitter fitted into a dynamometric spring which transforms the mechanical movement of the spring under the weight of a sinter mix component into an electrical impulse. The apparatus developed may be used for the automation of sinter mix preparation without a substantial redesign of the existing equipment.

D. Investigation of small blast furnaces with changed profiles. In 1953 - 54 on blast furnaces of the Kushvinskiy Works (No.1), A.K. Serov's Works (Nos.2 and 3) and Alapayevskiy Works (No.1) the hearth was sharply widened and the angle of the bosh belly increased up to complete elimination of the bosh belly. It was expected that an increase of the active weight of the stock would allow an increase in the wind blown and thus increase the output of furnaces without disturbing the normal burden descent. However, the investigation showed that the active weight of the stock does not determine the throughput of furnaces and therefore the coefficient of active weight cannot be assumed as completely characterising the suitability of a furnace profile.

Card2/8 A decrease of the ratio of the throat diameter to hearth diameter

Research Work of the Ural Iron and Steel Institute.

from 0.89 to 0.80 in furnaces of the Serov Works (Zavod im.Serova), from 0.85 to 0.75 in the furnace of the Kushvinsk Works (Kushvinskiy Zavod) and from 0.91 to 0.70 in the furnace of the Alapeyev Works (Alapeyevskiy Zavod) led to: an approach of the active zone of the hearth towards walls, an increase of the hydraulic resistance of the upper part of the furnace, a sharp development of peripheral flow of gases with subsequent extremely unstable furnace operation. As a result of the work, the technological necessity for a bosh belly was confirmed, as well as the relationship between the tuyere parameters and the furnace profile (the dependence of the degree of protrusion of tuyeres on the ratio of throat diameter to hearth diameter). Useful height of small furnaces should be about 15 m and the ratio of throat diameter and bosh diameter to hearth should be 0.90 and 1.16 - 1.20, respectively. Generalisation of the work of furnaces confirmed the relationship between the character of burden descent and gas flow in the furnace with its profile.5. Introduction of an open hearth practice with application of oxygen on NTMZ (jointly with NTMZ, TsNIIChM, VNIIMT and UOINII0). Oxygen enrichment of air up to 25% of O_2 (with a consumption of 24 m^3 of oxygen per ton of steel) increased the output of furnaces by 15% and decreased considerably the consumption of fuel.

Card3/8

F. Collection of starting data for an automatic control of the thickness of strip during cold-rolling on a three-stand mill MMK (jointly with MMK). Causes of variation in the thickness of the cold-rolled strip were investigated. As a result of these investigations the following relationship between the pressure of metal on rolls, tension of strip between stands, the thickness of the starting strip and the thickness of the finished strip was established:

$$h = H\left[1 - C_1C_3C_4\,(h - s) - C_1^3C_4^3C_5(h - s)^3\left(50 - C_2\frac{v_1}{v_1 + 1}\right)^{0.6}\right]$$

where H and h - the thickness of strip before and after rolling, respectively, mm; C_1 - coefficient of rigidity of stand (for the mill investigated 300 t/mm^2). C_2, C_3, C_4 and C_5 - empirical coefficients of proportionality between the basic rolling parameters: pressure, tension and strip thickness (for the mill investigated: $C_2 = 40 - 60$ T; $C_3 = 41 \cdot 10^{-5}$; $C_4 = 710$: B; $C_5 = 45 \cdot 10^{-12}$); B - width of the strip, mm;

Card 4/8

S - clearance between rolls; v_i - the velocity of rolls in last but one stand; $v_i + 1$ - the velocity of rolls in the subsequent stand. This relationship can be used as a basis for the design of an automatic control for the mill.

G. Thermal treatment of moving steel strip using induction heating. (In co-operation with: Institute of Physics of UFAN (Institut Fiziki UFAN) and the Kuybyshev Nizhne Tagil'sk Works (Nizhne-Tagil'skiy Zavod im. Kuybysheva). An investigation of the kinetics of processes taking place during rapid electrical heating of cold-rolled strip from various steels (stainless, austenitic, carbon, dynamo and transformer) indicated that the velocity of re-crystallisation is high which makes the use of electrical annealing possible. A method of induction heating of moving steel strip in a transverse magnetic field as well as the method of temperature control across the width of the strip were developed. In an experimental induction apparatus, heating of stainless steel strip 400 mm wide and 0.2 -1.5 mm thick was successfully tested under industrial conditions. An apparatus for continuous induction annealing of stainless strip in a protective atmosphere is being designed.

Research Work of the Ural Iron and Steel Institute. 133-7-26/28

H. Improvements in the magnetic properties of hot-rolled transformer steel (in co-operation with the Verkh-Isetskiy Works). The possibility of reducing specific losses and increasing the magnetic induction of transformer steel by smelting it without the use of aluminium and with some increase in the temperature of vaccuo treatment was established. It was also shown that a transformer steel with electro-insulating properties can be obtained by coating sheets with magnesia or lime paints and annealing in hydrogen.

I. Low-alloy steel of increased strength for building railway wagons. A steel (15ГФ) of the following composition was developed %: C 0.11 - 0.17, Mn 1.0 - 1.3, V 0.08 - 0.14; S $\leq$ 0.05, P $\leq$ 0.05 and with the following mechanical properties (for cross-sections up to 20 mm):

σ_B 48 kg/mm^2; $\sigma_s \geq$ 35 kg/mm^2; $\delta \geq$ 20%; α_k = 8 kgm/cm^2; bending angle 180°. The weldability of this steel and properties of welded seams are satisfactory. The corrosion resistance is similar to that of "Korten" steel (ГОСТ 5272-50). Economical calculations confirmed that the use of 15ГФ steel instead of carbon steel Ст.3 for wagon building is advantageous.

Card 6/8

Research Work of the Ural Iron and Steel Institute. 133-7-26/28

J. Improvement in the durability of annealing boxes. Cast iron boxes with spheroidal graphite for annealing tinned sheets under conditions of the Lysvenskiy Works had a 20% longer life than steel boxes.

K. Study of the fluxing processes during tinning. As a result of laboratory studies of the physico-chemical processes taking place in the flux the following were established: a) the nature of the hydrolysis of zinc chloride, zinc chloride - tin chloride, zinc chloride-tin chloride-ferrous chloride, as well as the velocity of formation of $FeSn_2$ according to the reaction: $3Sn + FeCl_2 \rightarrow FeSn_2 + SnCl_2$ at various temperatures; b) the dependence of the melting of sheets with tin on the composition of flux, micro-geometry and the quality of preparation of sheets for tinning; c) rational composition of flux at which a good wetability of sheets by tin at a minimum tin consumption can be obtained (88.2 - 78.2% $ZnCl_2$, 5 - 10% $SnCl_2$, 1.2% $FeCl_2$ and 5 - 10% H_2O). The results of this work were confirmed in the Lys'venskaya Works.

L. Rapid electro-chemical degreasing and pickling of tinned sheets. The dependence of the process on the nature of the

Card7/8

Research Work of the Ural Iron and Steel Institute. 133-7-26/28

current applied chemical composition of degreasing solution containing various emulsifiers and types of grease left on sheets after rolling was established.

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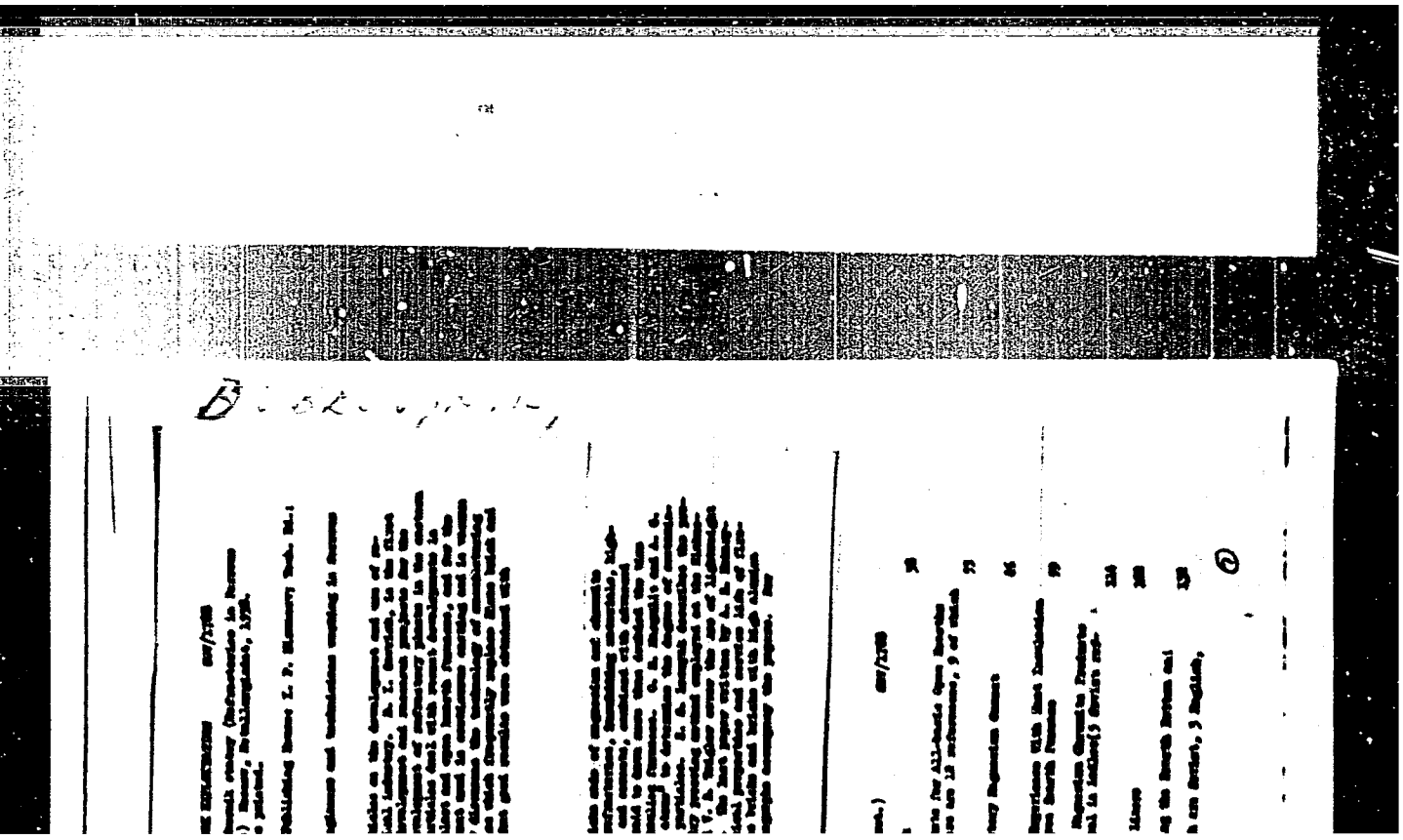
Card 8/8



DOBROV, N.F.

UMRIKHIN, Petr Vasil'yevich, prof., doktor tekhn. nauk; [illegible] red.; LUCHKO, Yu.V., red. izd-va; ZEF, Ye.M., tekhn. red.

[Slag formation in the basic open-hearth process] Shlakoobrazovanie v osnovnom martenovskom protsesse. Sverdlovsk, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie, 1958. 192 p. (MIRA 11:7)

(Open-hearth process)

DUBROV, N.F.

133-58-3-19/29

AUTHOR: Dubrov, N.F., Candidate of Technical Sciences

TITLE: The Influence of Aluminium on Specific Losses of Transformer Steel (Vliyaniye alyuminiya na udel'nyye poteri transformatornoy stali)

PERIODICAL: Stal', 1958, Nr 3, pp 246 -248 (USSR)

ABSTRACT An investigation of changes in the chemical composition and structure of transformer steel, containing various amounts of aluminium, after annealing in an industrial vacuo-furnace is described. The metal for experiments was smelted in a 20-ton arc furnace using normal technology (Ref.4). The metal was bottom poured into 500-kg ingot moulds. During teeming of the first two ingots, no aluminium was added; to the next two ingots 2 kg of aluminium was added into the metal stream and to the following two ingots - 4 kg. The corresponding sheets were designated as A-0, A-2, A-4. Experimental lots of sheets were annealed at 1 140 °C for 24 hours with a residual pressure of 70 mmHg. The chemical composition of samples taken before and after annealing - Table 1; the content of oxide non-metallic inclusions before and after annealing - Table 2; samples of of microstructure - Figs. 1-3; electromagnetic properties - Table 3. It was found that on high temperature annealing of transformer steel containing aluminium, without removing air,

Card 1/2

The Influence of Aluminium on Specific Losses of Transformer Steel 133-58-3-19/29

the formation of oxides and nitrides of aluminium is inevitable. The latter leads to a diminution of ferrite grains and therefore, to an increase in specific losses. For the above reasons on smelting transformer steel for high-temperature annealing, additions of aluminium even in small quantities should be avoided. The use of aluminium for the deoxidation of steel should be discontinued and an attempt made to decrease the aluminium content in ferrosilicon used for alloying transformer steel. The determination of non-metallic inclusions was carried out in the Uralskiy institut chernykh metallov (Urals Iron and Steel Institute) and the Verkh-Isetskiy zavod (Verkh-Isetsk Works) under the direction of Ye.N. Yurkin.
There are 3 figures, 3 tables and 4 references, 3 of which are Soviet and 1 German.

AVAILABLE: Library of Congress

Card 2/2

133-58-4-15/40

AUTHOR: Dubrov, N. F. Candidate of Technical Science

TITLE: In the Urals Iron and Steel Institute (V Ural'skom institute chernykh metallov)

PERIODICAL: Stal', 1958, Nr 4, p 331 (USSR)

ABSTRACT: The development and mastering of the technology of continuous casting of transformer steel (in cooperation with TsNIIChM and Verkh-Isetskiy Works) was carried out. Two heats of transformer steel (not alloyed with aluminium) were continuously cast into slabs 150 x 475 mm and squares 200 x 200 on the Novo-Tul'skiy Works. The main technological parameters of casting: Temperature of steel passing into the mould, the velocity of withdrawing, conditions of primary and secondary cooling and conditions of slow cooling of semis were determined. Finished sheets from the experimental metal in specific losses and magnetic induction did not differ from the usual transformer steel but had higher plasticity. Thus, on continuous casting of transformer steel, its silicon content can be somewhat increased which will decrease specific losses.

Card 1/1 1. Steel--Casting

SOV/137-58-11-22965

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 162 (USSR)

AUTHOR: Dubrov, N. F.

TITLE: Heat Treatment of Transformer Steel in a Vacuum (Termicheskaya obrabotka transformatornoy stali v vakuume)

PERIODICAL: Prom.-ekon. byul. Sov. nar. kh-va Sverdl. ekon. adm. r-na, 1958, Nr 4, pp 8-11

ABSTRACT: A description is given of the furnaces and the technological processes of vacuum annealing of sheet transformer steel used in the metallurgical plants of the USSR. Hot-rolled E43 steel 0.50 and 0.35 mm thick is annealed under a 20-40 mm Hg vacuum at 1110 - 1120°C by the following procedure: Heating for 18 hours, soaking for 24 hours, cooling to 500° in 100 hours. Cold-rolled E310, E320, and E330 steel 0.50 and 0.35 mm thick is annealed by the following procedure: Soaking at 1100 - 1150° for 20 - 24 hours, cooling under vacuum to 600° in. 70-80 hours, cooling under a muffle to 250°. The "Zaporoshstal'" steel plant has developed the following technique of rapid annealing: Soaking for 2 hours at 1140°, then for 22 hours at 1100°, cooling to 950°, replacing of a hot hood by a cold one,

Card 1/2

Heat Treatment of Transformer Steel in a Vacuum

formation of a secondary vacuum, cooling to 650°. It is noted that there is little difference between an open-hearth steel annealed in a vacuum and electric-furnace steel.

T. F.

SOV/126-6-4-24/34

AUTHORS: Lapkin, N.I., Dubrov, N.F.

TITLE: Cold Rolled Dynamo Steel (Kholodnokatanaya dinamnaya stal')

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 4, pp 739-744 (USSR)

ABSTRACT: Data are given on the features of manufacture and on improving the magnetic properties of the first batch of cold rolled dynamo steel manufactured by the Magnitogorsk Metallurgical Combine. The steel was smelted in an arc furnace and its composition was as follows: 0.02% C; 0.10% Mn; 1.35% Si; 0.012% P; 0.008% S; 0.02% Cr; 0.10% Ni. The steel was cast by means of a syphon into ingots weighing seven tons which, after heating to 1220-1280°C, was rolled into slabs of 100 x 800 mm cross section. The slabs, weighing 950 to 1100 kg, were heated in 3-zone holding furnaces from an initial 20°C. The temperature in the holding zone was 870 to 930°C and the temperature in the soaking zone was 1275-1320°C. Then the slabs were rolled to a thickness of 2.2 mm on a 10-stand continuous hot mill, the rolls

Card 1/6

Cold Rolled Dynamo Steel

of which were 800-500 mm dia. with a barrelled length of 1450 mm. The rolling temperature after passing the rough rolling stands was 1140 to 1160°C, the temperature at the end of the rolling was 870-905°C; the slabs were left in the furnace for 90 minutes. The hot rolled strips of 2.2 x 800 mm, weighing 900 to 1000 kg, were etched continuously in sulphuric acid at a speed of 25 m/min at 45 to 90°C with a concentration of the etching solution of 15 to 20%. After etching, the greased hot rolled coils were rolled on a 3-stand mill with a diameter of the rolls of 450 mm and a barrelled length of 1450 mm down to a thickness of 1.0 mm. The speed of the first cold rolling was 3.5 m/sec. In contrast to the present manufacturing technology of cold rolled transformer steel, the 1.0 mm thick dynamo steel was coiled and without intermediate bright annealing it was subjected to a second cold rolling, to a thickness of 0.50 mm, on a 6-roll reversing stand (roll diameter 185 mm, barrelled length 850 mm). Individual strips were rolled on the reversing mills down to a thickness of 0.35 mm in five passes. A

Cold Rolled Dynamo Steel

distinguishing feature of the manufacture of this batch of dynamo is the absence of decarburisation annealing, cold rolling from 2.2 down to 0.50 and even 0.35 mm without intermediate bright annealing and final low temperature annealing inside a protective gas. Individual sheets or packets of the cold rolled dynamo steel were subjected to high temperature annealing in vacuum for the purpose of eliminating harmful admixtures and for obtaining a coarse grain structure. As was shown in earlier work of the authors (Ref.1), high temperature annealing in hydrogen, in deep vacuum or in neutral gases bring about a considerable increase of the magnetic induction in weak fields and a reduction in the coercive force even in low alloy (hot rolled) dynamo steel, in spite of the α to γ transformations which take place. The applied heat treatment regimes of the cold rolled dynamo steel are entered in Table1, p 740. In Table 2 the specific losses and the magnetic induction in strong fields are entered for a dynamo steel which was subjected to a final low temperature

Cold Rolled Dynamo Steel

annealing inside a protective gas. It can be seen that the specific losses of such a steel are relatively high. The influence of heat treatment and of the thickness of the sheets on the specific losses of cold rolled dynamo steel containing 1.35% Si is graphed in Fig.1. In Fig.2 the influence is graphed of the heat treatment regime on the magnetic induction of cold rolled dynamo steel. In Fig.3 the dependence is graphed of the specific losses of electrical steels on the Si content. In Fig.4 curves of the magnetic anisotropy of cold rolled dynamo steel after various heat treatment regimes are graphed. The author summarises his conclusions thus:

1. After low temperature annealing in a neutral gas (without applying decarburisation and intermediate annealing), low alloy cold rolled dynamo steel has a higher magnetic induction and a higher filling coefficient than hot rolled dynamo steel, the specific losses being equal in both cases.
2. The specific losses of this steel after high temperature annealing in vacuum decreases to the level

Cold Rolled Dynamo Steel

of that pertaining to medium alloy hot rolled transformer steel. Thereby, a considerable growth of the grains takes place and an increase in the magnetic induction in weak and medium fields.

3. Reduction of the sheet thickness from 1.0 to 0.35 mm leads to a reduction to half of the specific losses of coarse grain cold rolled dynamo steel. A further reduction of the specific losses can be achieved by increasing the silicon content and eliminating harmful admixtures.

4. The recrystallisation texture and the magnetic anisotropy of cold rolled dynamo steel are insignificant

Card 5/6

Cold Rolled Dynamo Steel

and decrease with increasing annealing temperature. There are 4 figures, 2 tables and 4 references of which 3 are Soviet and 1 German.

ASSOCIATION: Ural'skiy Nauchno-Issledovatel'skiy Institut Chernykh Metallov (Ural [illegible] Scientific Research Institute of Ferrous Metals)

SUBMITTED: 4th January 1957 (Initially)
3rd April 1957 (after revision)

DUBROV, N.F., kand. tekhn. nauk

Heat treatment of transformer steel in a vacuum. Biul. TSNIICHM no. 9:29-33 '58. (MIRA 11:7)

(Steel—Heat treatment)

133-58-4-6/40

AUTHOR: Dubrov, N.F., Candidate of Technical Science

TITLE: In the Urals Iron and Steel Institute (V Ural'skom institute chernykh metallov)

PERIODICAL: Stal', 1958, Nr 4, p 302 (USSR)

ABSTRACT: A short review of research work carried out in 1957 is given:
a) On the Chusovoy Works the production of vanadium pig iron at a low lime/silica ratio of slag (0.85 instead of 1.05) and increased blast temperature (750 to 800°C instead of 550 to 600°C) has been successfully carried out. This permitted economising 20% of limestone and 12% of coke with simultaneous improvement in the vanadium recovery.
b) Laboratory investigations on the influence of temperature, composition and amount of gas on the development of processes of reduction of iron oxides was carried out. The technology and principles of plant design for large scale production of sponge iron from rich magnetic concentrates with highly active gas from power coals were developed.
c) Intensification of the blast furnace process by changes in the composition of the blast (in cooperation

Card 1/2

In the Urals Iron and Steel Institute 133-58-4-6/40

with VNIIMT). Calculations were carried out on the evaluation of the effect of the application of blast with additions of coke oven, natural, producer (obtained on steam-oxygen blast), blast furnace and carbon dioxide gases as well as steam and oil at various temperatures of preheating the above components and their concentration in blast. The use of coal dust either by blowing in combustion products or natural coal dust was also considered. The following conclusions were reached:
1. For the successful application of a fuel enriched blast, the air part of the blast should be enriched in oxygen.
2. Enrichment of the blast with oil, natural, coke oven or producer gas, as well as blowing in coal dust or products of preliminary combustion can reduce the coke rate by 30 to 35% and increase the output by 40%.
3. Increasing the temperature of blast components also improves production indices as with the ordinary blast.
4. Introduction into the blast of components absorbing large quantities of heat in the tuyere zone (steam, CO_2, etc) cannot be recommended.

Card 2/2 1. Iron--Production 2. Industrial research--USSR

133-58-4-19/40

AUTHOR: Dubrov, N. F., Candidate of Technical Science

TITLE: In the Urals Iron and Steel Institute (V Ural'skom institute chernykh metallov)

PERIODICAL: Stal', 1958, Nr 4, p 339 (USSR)

ABSTRACT: a) Investigation of the process of rolling on a planetary mill. It was established that the following formula should be used for the calculation of the thickness of slab for rolling on a planetary mill:

$$H = C \frac{D + 2d}{z^2},$$

and for the determination of the velocity of feeding strip into rolls at a permissible reduction of metal:

$$v = 0.71\mu^2 c^{-2} z^2 \frac{n_B}{2} \frac{Dd}{D + d} (1 - k)$$

where H - thickness of slab;
D - diameter of supporting roll;
d - diameter of working rolls;
z - number of working rolls;
c - coefficient (30 + 40);
n_B - angular velocity of supporting roll;

Card 1/4

k = 0.02 - 0.05 - coefficient, for the loss of velocity of the yoke due to slipping of rolls on metal.

A model of a planetary mill 250 was developed and made for experimental purposes. On rolling on this mill, strip 3 mm thick from 25 mm thick with a peripheral velocity of rolls 280 r.p.m., a satisfactory agreement of calculated and experimental data was obtained.

b) Mastering of the production of economic rolled profiles (in cooperation with KMK). Experimental rolling of lightened beams was carried out on the Kuznetsk Metallurgical Combine. Investigations indicated that in the technology of rolling lightened profiles (18-22% lighter) differ little from normal profiles.

c) A study and an improvement of reduction conditions on mills for rolling in piles (in cooperation with the Lysvenskiy Metallurgical Works). The results of investigations of loads during rolling of sheets and of elongation in the individual passes, as well as of elastic deformations of the stand confirmed the high accuracy of the A. F. Golovin equation: Q - k (h - s), whereupon the coefficient of rigidity of the stand was found to be equal

to 500 t/mm; the smallest initial clearance, obtainable in practice equals 0.7 mm and the deflection of a pair of rolls 0.01 mm for each 100 tons of rolling load (at 500°C). Loads during individual passes for the rolling practice used (with constant pressure) were non-uniform: from 1350 t in the first pass to 850 t in the last pass. The non-uniform distribution of loads and reductions in individual passes contributes to the appearance of various defects in the metal. During rolling with screwed down screws a more uniform distribution of loads and elongations in individual passes is obtained and the proportion of surface defect sharply decreases. Technical conditions for the design of a mechanised screw down arrangement and for its automatic control were developed (tests gave positive results).

d) The development of the technology of removal of scale by its reduction with sodium hydride. In order to develop the technology of reduction of scale with sodium hydride the following problems were studied: the dependence of the degree of dissociation of ammonia on temperature, velocity of the passage of gases (hydrogen and nitrogen),

In the Urals Iron and Steel Institute 133-58-4-19/40

the composition and the amount of catalyst (iron shavings), as well as the dependence of the velocity of formation of sodium hydride on the amounts of gas and metallic sodium supplied to the generator and the dependence of the velocity of pickling on the concentration of sodium hydride and the bath temperature for carbon, transformer and stainless steels. Technological assignments were developed for the design of semi-industrial plants on the works: Pervoural'sk Novotrubnyy, Metallurgical Works imeni Serov and Sverdlovsk transport-machine building works (the final technology will be developed on these works).

1. Rolling mills--Analysis

Card 4/4

133-58-4-27/40

AUTHOR: Dubrov, N. F., Candidate of Technical Science

TITLE: In the Urals Iron and Steel Institute (V Ural'skom institute chernykh metallov)

PERIODICAL: Stal', 1958, Nr 4, p 356 (USSR)

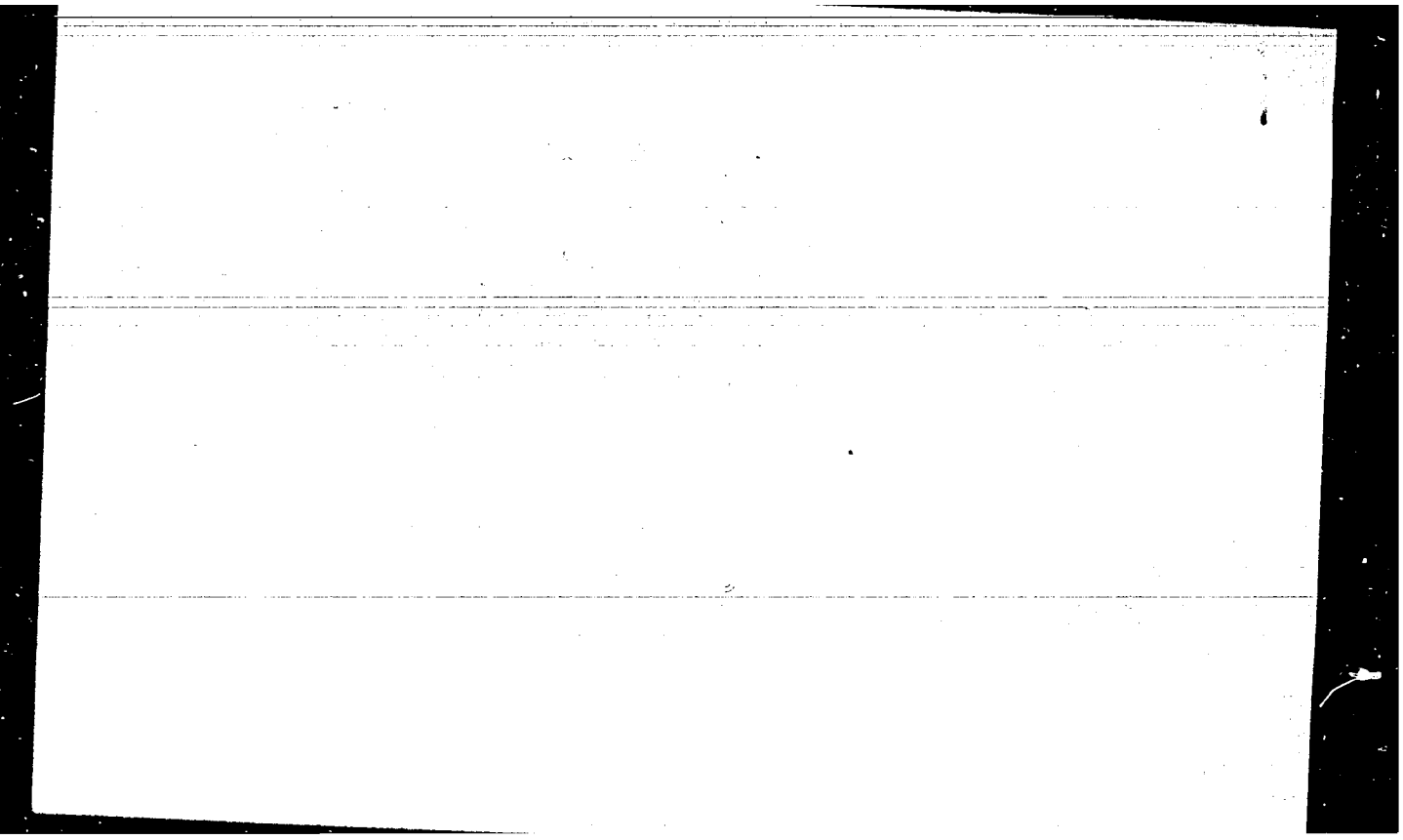
ABSTRACT: Development of stainless austenitic steels with lower nickel content (in cooperation with Uralkhimmashzavod). For replacing steel 1Kh18N9 two new steels of high concentrations of manganese and nitrogen and with 2 and 2.5 times lower content of nickel respectively, were developed. Steels retain an auctenitic structure at all temperatures of hot mechanical working and are of the following chemical composition:

Type of Steel.	C	Mn	Si	Ni	Cr	N
1Kh17N4G7Az	≤0.12	6.0-8.0	≤0.8	4.0-4.5	16.5-18.0	0.12-0.18
1Kh17N3G8Az	≤0.12	7.0-9.0	≤0.8	3.3-4.5	16.5-18.0	0.18-0.24

	P	S
1Kh17N4G7Az	≤0.035	≤0.030
1Kh17N3G8Az	≤0.035	≤0.030

...ith the following mechanical properties:

Ca



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In the Urals Iron and Steel Institute 133-58-4-27/40

σ_B 70-85 kg/mm^2; σ_s 33-40 kg/mm^2; δ_{10} 48-53%; ϕ 57-65%; a_k at - 60°C 20-25 kgm/cm^2. Thus, the strength properties of the new steels are 20-25% higher than those of 1Kh18N9. The proposed steels possess sufficient corrosion resistance in nitric, lactic, moleic acids and other media and can be used in both the cast and rolled state. Additions of tantalum and niobium to these steels as well as an appropriate heat treatment sharply decrease the tendency of these steels to intercrystalline corrosion. Investigations of weldability, corrosion resistance and other properties under conditions of chemical machine building gave positive results.

1. Stainless steel--Development 2. Stainless steel--Chemical properties

Card 2/2

AUTHOR: Dubrov, N. F., Candidate of Technical Science 133-58-4-37/40

TITLE: In the Urals Iron and Steel Institute (V Ural'skom institute chernykh metallov)

PERIODICAL: Stal', 1958, Nr 4, p 378 (USSR)

ABSTRACT: a) The development of the technology of application of exothermic mixtures in order to decrease the volume of shrinkage heads in castings. Best results were obtained with a mixture consisting of equal volumes of powders of aluminium, iron scale and portland cement 400-500.
b) An improvement in the production of highly durable ingot moulds from nodular iron. A 2 to 2.5 times increase in the service life of small and medium sized ingot moulds was obtained by making them from nodular iron. Further improvement (10 to 15%) was obtained by chill casting of moulds and their subsequent graphitising heat treatment.

1. Steel castings--Test results

Card 1/1

133-58-4-39/40

AUTHOR: Dubrov, N. F., Candidate of Technical Science

TITLE: In the Urals Iron and Steel Institute (V Ural'skom institute chernykh metallov)

PERIODICAL: Stal', 1958, Nr 4, p 383 (USSR)

ABSTRACT: Development of a new titanium enamel USI is mentioned - no details are given.

1. Titanium—Applications

Card 1/1

SOV/133-59-2-6/26

AUTHORS: Dubrov, N.F., Gorlach, I.A., Keys, N.V. and Zhukov, D.G.

TITLE: An Investigation of the Heterogeneity of a Transformer Steel Ingot (Issledovaniye neodnorodnosti slitka transformatornoy stali)

PERIODICAL: Stal', 1959, Nr 2, pp 117-122 (USSR)

ABSTRACT: The chemical and structural non-uniformity of a 6.2 ton ingot of transformer steel was studied. The method of smelting steel in a 40 ton arc furnace is described in some detail. The chemical composition of the metal in the ladle was %: C 0.04; Si 3.20; Mn 0.10; Ni 0.12; Cu 0.12; S 0.007; P 0.009 and Cr 0.04. The metal was bottom poured into 6.2 ton ingots. The shape and dimensions of the ingot are shown in Fig.1. A longitudinal plate, 20 mm thick was cut cut from the middle part of the ingot, from which 60 samples were collected by drilling for chemical analysis as shown in Fig.1. The segregation of longitudinal and transverse cross-sections of carbon, sulphur, phosphorus, aluminium and nitrogen is shown in table 1 and Fig.2. The degree of segregation was as follows:

Card 1/4

An Investigation of the Heterogeneity of a Transformer Steel Ingot

Deviation from mean %	C	S	P	Al	N_2
positive	30	30	20	25	20
negative	5	15	10	5	10

Mean silicon content was 3.10%, maximum 3.23% and minimum 2.95%. No regularity in the distribution of silicon was observed. Mean manganese content was 0.095%, a number of samples taken from the upper part of the ingot contained 0.110% and from the bottom part 0.092%. On the basis of mean values it is concluded that the non-uniformity in the distribution of manganese was insignificant. Mean chromium content was 0.030%; in the upper part of the ingot - 0.035% was the predominant concentration and in the bottom part - 0.025%; maximum 0.041% and minimum 0.041%. Thus the distribution of chromium was found to be very non-uniform. The contents of copper and nickel in all samples was stable, for copper it varied from between 0.10 to 0.11% and for nickel from 0.11 to 0.12%. The quantities and composition of non-metallic inclusions which varied from 0.0172 - 0.0066% are shown in table 2,

An Investigation of the Heterogeneity of a Transformer Steel Ingot

their appearance in Fig.3. The predominant component of non-metallic inclusions was alumina but considerable quantities of TiO_2, SiO_2 and FeO were also found. The size of the individual inclusions was comparatively small, mainly 5μ only a small proportion was of about 50μ. The macro and microstructure of sections taken from various parts of the ingot is shown in Fig 4, 5 and 6 respectively. It is concluded that a considerable improvement in the heterogenity of transformer steel can be obtained if the contents of carbon, sulphur and aluminium are decreased to 0.02%, 0.003% and traces respectively. The introduction of electromagnetic stirring will also improve

SOV/133-59-2-6/26

An Investigation of the Heterogeneity of a Transformer Steel Ingot

the uniformity of steel. There are 2 tables, 6 figures and 5 references of which 4 are Soviet and 1 English.

ASSOCIATION: Ural'skiy Institut Chernykh Metallov i Chelyabinskiy Metallurgicheskiy Zavod (Ural Ferrous Metals Institute and Chelyabinsk Metallurgical Works)

Card 4/4

STRUGOVSHCHIKOV, Dmitriy Pavlovich; [illegible] red.; KHL'NIK, V.P., red.izd-va; ZHF, Ye.N., tekhn.red.

[Making low-carbon steel] Proizvodstvo malouglerodistoi stali. Izd.2., ispr. i dop. Sverdlovsk, Gos.nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie, 1959. 302 p. (MIRA 12:7)
(Steel--Metallurgy)

SOV/133-59-6-6/41

AUTHOR: Dubrov, N.F., Candidate of Technical Sciences

TITLE: In the Ural Scientific-Research Iron and Steel Institute (V Ural'skom nauchno-issledovatel'skom institute chernykh metallov)

PERIODICAL: Stal', 1959, Nr 6, pp 501-502 (USSR)

ABSTRACT: 1. Industrial tests of concentrates from Kachkanar Ores (in co-operation with Uralmekhanobr, Sverdlovsk Sovnarkhoz and Chusovskiy Metallurgical Works). The industrial testing of the above ores (16-17% Fe, 0.13 - 0.16% V_2O_5) consisted of: preparation of concentrates (58% Fe, 0.55 V_2O_5), production of fluxed sinter, smelting in a 257 m^3 blast furnace with a recovery of 86% of vanadium in the pig iron (C 4.4; Si 0.50; Mn 0.20; V 0.43; Cr 0.15; Ti 0.20; S 0.05; P 0.05) and blowing of iron in a 12-17 ton convertor to a residual content of vanadium in the metal of 0.02 - 0.04%. The content of vanadium in slag 9.0 - 12.5%. The tests confirmed the possibility of utilising Kachkanar deposits as a powerful ore base for the Urals.

Card 1/3 2. A study of the dependence of the pressure drop along

In the Ural Scientific-Research Iron and Steel Institute

the furnace height on the technological indices of the smelting process in order to choose parameters for an automatic control of blast furnace operation (in co-operation with VNIIMT, Chusovskiy Works and NTMK). It was found that static pressure of the gas at walls at any point along the furnace height sufficiently characterises the movement of the gas in the blast furnace as a whole. Pressure drops between the hearth - bottom of the stack and top of the stack - and the throat on the Chusovskiy furnace are most sensitive to changes in the gas movement. Pressure drops along the height of the furnace change: a) on variations in the blast volume of 50 m^3/min and more; b) on variations of the temperature and humidity of the blast accompanied by changes in the thermal state of the furnace with time; c) on changes in the level of the stock line. The dependence of pressure drop along the furnace height on the proportion of fines (0 - 5 mm) in ores (from 12.9 to 28.8%) was not established. Main principles on

Card 2/3

At the Ural Scientific-Research Iron and Steel Institute

the control of blast furnace operation on the basis of pressure drop were formulated (parameters controlled top pressure, sequency of charging, temperature and volume of the blast).

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AUTHOR: Dubrov, N.F., Candidate of Technical Sciences

TITLE: At the Ural Iron and Steel Scientific Research Institute (V Ural'skom nauchno-issledovatel'skom institute chernykh metallov)

PERIODICAL: Stal', 1959, Nr 6, p 551 (USSR)

ABSTRACT: 1. Control of sheet rolling rolls by continuous measurement of temperatures of their necks (in co-operation with the Lys'va Metallurgical Works). Control of the profile of rolls by continuous measurement of temperatures of their necks with contact thermocouples was developed. The method permitted reducing temperature drop along the neck of a roll to $\pm$ 20°C. This decreased the proportion of defective sheets due to "coloured spot" and welding by a factor of 1.5 to 2.
2. Improvement in the technology of production of cold rolled transformer sheets (in co-operation with the Magnitogorsk Combine).
The influence of the chemical composition, conditions of reduction during cold rolling and technology of the roughing and vacuum annealing on the magnetic properties

Card 1/3

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of cold rolled transformer sheets was studied. It was established that the carbon content in the intermediate strip should not exceed 0.020%. The necessary decarburisation is obtained during rough annealing of a 40 ton charge in coils (3 - 4 tons) at 750 - 825° for 40 hours. An increase in the degree of reduction during second cold rolling by increasing the thickness of the hot rolled strip from 2.2 to 2.5 mm and intermediate strip from 1.0 to 1.2 mm improves the magnetic properties of sheets 0.50 mm thick. Application of intermediate soaking at 950°C during vacuum annealing with subsequent heating to 1140°C increases the magnetic induction of steel by 200 - 400 Gauss. A decrease in the cooling velocity by decreasing the temperature at which the hood is removed from 600 to 550°C improves and an acceleration of cooling (by removing the hot hood at

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950°C and replacing it with a cold one) deteriorates the magnetic properties of steel.

SOV/133-59-6-34/41

AUTHOR: Dubrov, N.F., Candidate of Technical Sciences

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PERIODICAL: Stal', 1959, Nr 6, p 566 (USSR)

ABSTRACT: 1. Development of some new low alloy, high strength cast and rolled steels for the construction of railway wagons and chemical machine building. On the basis of investigations of the mechanical and casting properties of low alloy steels for industrial testing in railway wagon construction, steel 17KhGSL was proposed for cast parts. The composition %: C 0.13 - 0.20; Mn 1.20 - 1.60; Si 0.30 - 0.60; Cr 0.30 - 0.60; Cu 0.15 - 0.40. Conditions for thermal treatment of steel 14G2 for chemical machine-building were established and the influence of its alloying with titanium and vanadium was studied. For welded structures with annealing it is proposed to use steel 14G2 with an addition of 0.04 - 0.10% of

Card 1/3

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vanadium.

2. Replacement of high manganese steel (Hadfield) in shaped castings by graphitised steel. It was established that entectoidal graphitised steel used as a lining in crushing, mixing etc equipment is not inferior in its wear resisting properties to Hadfield steel. The following composition of graphitised steel is proposed: % C 1.0 - 1.3; Si 1.0 - 1.3; Mn 1.0 - 1.3; P 0.03 - 0.06; S 0.03 - 0.06; Ti 0.1 - 0.2; Cr up to 0.3. It was decided by the Sverdlovsk Sovnarkhoz to produce 4000 tons of castings from the above steel for industrial testing.

3. Technology of production of hot rolled transformer steel with specific losses (P10/50) of 0.80 W/kg (in co-operation with Verkh-Isetsk Works). By decreasing the sum of harmful admixtures (S, Ni, Al_2O_3 and Ti) to 0.030 - 0.040% in hot rolled steel during its smelting and teeming and annealing in vacuum furnaces, the production of sheets 0.35 mm thick with specific losses P10/50 within 0.78 - 0.82 W/kg can be secured.

SOV/133-59-6-34/41

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More stable results are obtained if steel is submitted to vacuum treatment in the ladle.

Card 3/3

SOV/133-59-6-41/41

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TITLE: In the Ural Iron and Steel Scientific Research Institute (V Ural'skom nauchno-issledovatel'skom institute chernykh metallov)

PERIODICAL: Stal', 1959, Nr 6, p 575 (USSR)

ABSTRACT: An improvement of the chemical stability of enamel coatings. The mechanism of action of an agressive medium (boiling hydrochloric acid) on enamel coating was established (not specified) which permitted improving the chemical resistance of enamel by a thermal treatment of a silicious film and by hydrophobisation of its surface (no details).

Card 1/1

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AUTHOR: Dubrov, N.F. SOV/126-8-5-19/29

TITLE: Hot-Rolled Transformer Steel with Low Specific Losses

PERIODICAL: Fizika metallov i metallovedeniye, Vol 8, 1959, Nr 5, pp 752-757 (USSR)

ABSTRACT: Specimens from 90 batches of steel which had been annealed in vacuum furnaces at 1090 °C were selected for chemical investigation. In these specimens the following constituents were estimated: Si, C, Mn, S, P, Cr, Al, Cu, Ti, Ni, N_2 and Al_2O_3. The results are given in Table 1. Here two groups of metals are shown: (1) metals melted in electric arc furnaces, and (2) those melted in Marten's furnaces. The specimens used for metallographic investigation were in the form of strips cut out from sheet with specific losses $P_{10/50}$ of from 0.75 to 0.85, from 0.95 to 0.99 and from 1.22 to 1.27 watt/kg. The results of the chemical analysis of specimens selected for metallographic investigation and data about the specific losses are shown in Table 2. The quantity of non-metallic inclusions, their nature and size, ferrite grain size and microstructural components were determined

Card 1/4